RISK MANAGEMENT AND BUSINESS CONTINUITY IN PUBLIC HOSPITALS: THE CASE STUDY OF TAWAM HOSPITAL UNITED ARAB EMIRATES (UAE)

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ABSTRACT

Despite the substantial amount of research in risk management, there is no clear evidence for any research or study that has investigated risk management and business continuity in UAE public hospitals, specifically the Tawam Hospital UAE. Therefore, the current study aims to investigate the impact of risk management culture, risk management process, and risk management governance on the business continuity of public hospitals in the UAE. The data were collected through a questionnaire distributed to 600 respondents, of which 297 (49.5 per cent) were successfully retrieved. Among the retrieved questionnaires, 24 were unusable due to either partial filling by the respondents or multiple options on some questions. Data was collected through a questionnaire approach where a valid sample of this brought the total usable questionnaire to 273 responses that have been tested empirically, representing 45.5 per cent of the total questionnaire originally administered. Moreover, the study findings reveal that there is a significant mediating effect of management commitment on the relationship between risk management process and business continuity. Finally, the quantitative analysis through survey questionnaires technique also reveal that personal factors, social factors, and environmental factors are major indicators for the business continuity in the Tawam Hospital. From the result, it is shown that collectively the three exogenous constructs explained less than 1% variability in management commitment towards business continuity in Tawam Hospital UAE. Therefore, the risk management practices of the study (risk management culture, risk management process, and risk management governance) along with the mediator management commitment are essential to improve risk management in public hospitals in the UAE. Besides, the final model of the study can be used to replicate the investigation in other contexts such as private hospitals or other organizations since it provided insightful understanding for the risk management in public health organization in the UAE.

ABSTRAK

Walaupun terdapat banyak penyelidikan dalam pengurusan risiko, tidak ada bukti yang jelas adanya sebarang penyelidikan atau kajian yang telah menyiasat pengurusan risiko dan kesinambungan perniagaan di hospital awam UAE, khususnya Hospital Tawam UAE. Oleh itu, penyelidikan semasa ini bertujuan mengkaji kesan budaya pengurusan risiko, proses pengurusan risiko, dan tadbir urus pengurusan risiko terhadap kesinambungan perniagaan hospital awam di UAE. Data dikumpulkan melalui soal selidik yang diedarkan kepada 600 responden, yang daripadanya sebanyak 297 (49.5 peratus) jawapan berjaya didapatkan kembali. Antara soal selidik yang dikembalikan, 24 tidak boleh digunakan sama ada disebabkan pengisian separa oleh responden atau kerana pelbagai pilihan pada beberapa soalan. Data dikumpulkan melalui pendekatan soal selidik, iaitu sampel yang sah ini menjadikan jumlah soal selidik yang boleh digunakan ialah sebanyak 273 jawapan yang telah diuji secara empirik, mewakili 45.5 peratus daripada jumlah soal selidik yang pada asalnya dilaksanakan. Selain itu, dapatan kajian mendedahkan bahawa terdapat kesan pengantaraan komitmen pengurusan yang signifikan terhadap hubungan antara proses pengurusan risiko dengan kesinambungan perniagaan. Akhir sekali, analisis kuantitatif melalui teknik soal selidik tinjauan juga mendedahkan bahawa faktor peribadi, faktor sosial, dan faktor persekitaran merupakan petunjuk utama bagi kesinambungan perniagaan di Hospital Tawam. Daripada keputusan tersebut, ditunjukkan bahawa secara kolektif, ketiga-tiga konstruk luaran menjelaskan kurang daripada 1% kepelbagaian dalam komitmen pengurusan ke arah kesinambungan perniagaan di Hospital Tawam UAE. Oleh itu, amalan pengurusan risiko bagi kajian ini (budaya pengurusan risiko, proses pengurusan risiko, dan tadbir urus pengurusan risiko) bersama-sama dengan komitmen pengurusan pengantara adalah penting untuk meningkatkan pengurusan risiko di hospital awam di UAE. Selain itu, model akhir kajian ini boleh digunakan untuk meniru penyelidikan dalam konteks lain seperti hospital swasta atau organisasi lain kerana memberikan pemahaman yang mendalam untuk pengurusan risiko dalam organisasi kesihatan awam di UAE.

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BC	Business Continuity
ERM	Enterprise Risk Management
RM	Risk Management
BCM	Business Continuity Management

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CHAPTER 1

INTRODUCTION

1.1 Research Overview

Effective risk management (ERM) is a priority and commonly accepted approach in public sector organizations. It is regarded as the best-growing practice. Government officials—in the immediate and distant future—expect that the number of resources deployed in support of ERM will increase (Stanton, 2015). A popular approach for ERM is to enhance the organization's focus on risk management. This would help the organizational silos to be broken down by risk innovators and facilitates thoughtful risk analysis in major decision-making processes (Stanton, 2015). The situation in the UAE public sector is not so different from that in other developed nations. This study investigates the impact of risk management practices on business continuity in the UAE public sector.

The term "risk management" is used widely across the business world (Baines *et al.*, 2009; Steven, 2012; Datta & Roy, 2013; Parida *et al.*, 2013; Kohtamäki *et al.*, 2015). It refers to well-being, security, disaster management, business congruity, protection, and internal review (Boyle, 2015). The term is authentic that the capacities frame some portion of the more extensive subject of risk management. It implies concentrating on all risks of a foundation (Angela *et al.*, 2009; Parida *et al.*, 2015). The possibility of public sector risk management has turned into a well-known method for portraying the use of risk management throughout the organization.

Sakao et al. (2013), Steven (2012) and Hopkin (2018) defined risk management

(RM) as a process that focuses on particular methods and standards to overcome threats to organizations. It is one of the management sciences that has become formal internationally through training codes, principles, directions, and enactment (Beregovaya et al., 2019). Meanwhile, RM is essential to the organisation's overall management process (Anghelache *et al.*, 2010; Durugbo, 2013; Benedettini *et al.*, 2015). This exploration will utilize the less complicated term 'risk management'. It will broadly clarify the capacity, demonstrating how the different specialized orders related to the risk frame (Parida *et al.*, 2013; Kohtamäki *et al.*, 2015; Hillson & Simon, 2020).

Fundamentally, RM is a structured procedure used to identify, analyze and resolve risks on a non-stop basis before the risks hurt the conveyance limit of the establishment administration (Parida *et al.*, 2014; Reim *et al.*, 2013; Reim *et al.*, 2015). RM approaches the foundation's goals with a large variety of material threats. It is further stated that RM must cover all aspects of the foundation, and no part of the company should argue that it does not have to engage in its processes (Sakao *et al.*, 2013; Steven, 2012; Aven, 2016). Risk management works its way into the entire enterprise in the long term so that all layers of management engage in its procedures. Established risk-related skills—such as cyber risk management ability to quantify the risk, relationship-building skills, and analytical skills—are several examples of dealing with organizational risk (Choane, 2021). Many administrators emphasized that in-depth focus is required towards RM and related practices within the organization (Bilal et al., 2013). The fundamental explanation is that administrative conveyance and the interface of the public sector with partners have become considerably more demanding and dysfunctional. As demonstrated by numerous administration conveyances and general administration disappointments, authentic methods always fail (Azarenko *et al*., 2009; Steven, 2012; Baines & Lightfoot, 2013; Zey, 2020). As a result, corporate governance has enabled the public sector to deal with the adverse effect of risk factors (Datta & Roy, 2013; Parida *et al.*, 2013; Hubbard, 2020).

It is stated that there is a constructive and organized way of dealing with organizational risk (Hu & Pym, 2019). The public sector perceives risk control as an effective way to track risk (Azarenko *et al*., 2009; Steven, 2012; Baines & Lightfoot, 2013). Different institutions may have a range of current risk reactions, such as safety management and insurable risk management for internal control and public relations. Thus, it is crucial that distinctive sorts of risk be appropriately considered at a

corporate or process level.

The risk-centered portrayal and meaning of organizations' working conditions and operations have increased, expanding unmistakable quality over the late decades (Parida *et al.*, 2014; Reim *et al.*, 2015). In any case, while the risk translation and risk mentality of the revenue-driven organization are anything but difficult to delimit, augmenting benefit and expanding endeavor esteem are definitive objectives of risk management. These angles are given a thorough understanding in the public sector (Nordin *et al.*, 2011; Hardy & Maguire, 2020).

From the context of the world economy, the outbreak of COVID-19 has created serious threats to different sectors, including the hospital sector. More specifically, the burden on the hospitals has dramatically increased while dealing with the countless patients suffering from such epidemic diseases. The initial studies have revealed that those above the 60s with some pre-medical conditions like admission to Intensive Care Unit (ICU) are under significant attack of this pandemic with increasing pressure on hospitals to provide them with the best treatment (Presanis et al., 2021). Meanwhile, the risk management title is equally important for the hospital industry around the globe due to its significance in society and the community (Jafari et al., 2018). At the same time, over recent years, the risk management title, specifically in dealing with environmental concerns for better business operations, is also observed in the healthcare industry. However, the most significant point is to observe which factors play a major role while dealing with the risk dynamic in the healthcare industry (Zillien et al., 2019). At the same time, the title of business continuity is also applicable to the health industry and hospitals' however, for achieving such strategic objectives, a big consideration is required regarding risk management and its key components (Motevali Haghighi & Torabi, 2020).

To conclude, risk examination, risk appraisal, and risk management are utilized expressions in both the business and the public sector today; be that as it may, the general picture is blended with respect to understanding these ideas. The meaning of risk fluctuates by hypothesis, for example, in the specialized, financial, mental, and sociological methodologies (Baines *et al.*, 2009; Kohtamäki *et al.*, 2015; Hubbard, 2020). The risk ideas utilized as a part of the public sector stand nearest to what is known as the monetary approach; they, in any case, respect risk in negative terms much of the time. However, different organizations may use methods to manage risks, especially since risk management is continuous in the public sector. Therefore, the

current study aims to investigate RM culture, process, and governance dimensions with their effects on business continuity in public hospitals in the UAE.

1.2 Background of the Study

The demand for relevant RM capabilities grows in the public sector (PwC & AFERM, 2015). Public entities' directions of money-related management and control systems were produced through numerous progression procedures. Some incalculable occasions and conditions may block or undermine the accomplishment of any organization's objectives. However, dealing with risk factors is one of the most crucial organizational practices faced by public and private organizations (Carlsson-Wall et al., 2019; Nadikattu, 2019). Executives across the federal government and quasi-governmental organisations recognise the need for effective risk management, including support tools and best practices (PwC & AFERM, 2015). They also maintained that risk management enhances decision-making and facilitates accomplishing an organisation's mission, priorities, and goals.

In addition, RM exists in hospitals as a core corporate management strategy (Farokhzadian et al., 2015). Meanwhile, RM also focuses on organizational objectives where public sector establishments, including hospitals, have gotten proper attention from scholars and researchers (Hypko *et al.*, 2010; Jamil, 2019). PwC and AFERM (2015) see risk management as a practice that manages and combines a company's full range of risks, including threats and opportunities, into an overall enterprise strategic portfolio perspective.

Risk can take on many forms. For effective risk management, hospitals must determine their needs and integrate them into their work processes (Briner et al., 2013). A survey on public sector organizations conducted by PwC and AFERM (2015) found that only 26 percent of respondents consider their business scores well in terms of RM practices. On the other side, 48 percent reasonably and 26 percent less enthusiastically are dealing with embracing effective risk management as a value-add strategy. This is supported by the study of Russell et al. (2020), who focused on the health sector while arguing that there is tremendous potential for enhancing the perception of risk management in healthcare organizations. Additionally, such organizations are setting

up formal risk programming more aware of the benefits and becoming more knowledgeable about the RM benefits.

For organizations in the corporate domain, hospital risk management is an advanced organizational administration apparatus that tries to upgrade the aftereffects of business choices (Comite, Dong, Li *et al.*, 2020). Public sector organizations with a hierarchical structure are subjected to bureaucratic control where title like RM needs to be addressed more efficiently. Meanwhile, there is a range of perspectives through which public firms' operational efficiency and RM capabilities can be examined (Dernaoui & Verdelhan, 2021). For public sector firms like hospitals, the concept of RM deals with cognizant and dynamic control of risks (Adler, 2020; Saxena et al., 2020).

However, evidence from projects worldwide shows that risks are not adequately handled (Chan *et al.*, 2011; Jin, 2010; Britzelmaier et al., 2019), especially in hospitals (Di Tecco et al., 2020). The ambiguity of arrangements and the incomplete contracting nature of public sector projects have increased risk exposure (Marques & Berg, 2011; Enshassi et al., 2020). In several countries, the idea that privatization entails the transfer of all risks to the private sector is still widespread (Faulkner, 2004; Papajohn *et al.*, 2011; Lee & Schaufelberger, 2014). Therefore, the government needs to know whether the transfer of unacceptable risks is sub-optimal, as such transfer of threats to the private sector is beneficial. This is because the private sector, like hospitals, may come at a price, and the improper allocation of risks among stakeholders can lead to higher prices than necessary (Top et al., 2019; Dang et al., 2020). However, in the public sector, managing risk in hospitals is ostensibly more difficult than in the private sector, primarily because of challenges linked with the government.

From the standpoint of the RM difficulties in hospitals, making straightforwardness inside and remotely is crucial to seek against risk management and build up a comprehension of the organization's most significant risks. Some public sector hospitals have not yet distinguished which information they have for proper RM practices (Tanwar et al., 2020; de Araújo Lima et al., 2020). A few offices gather information yet create reams of words that only show crude information instead of blending it and drawing out suggestions for essential leadership. What makes a modest bunch of public sector hospitals exceed expectations on social occasions, risk bits of knowledge, and impart them to partners is the capacity to blend vast volumes of

possibly deficient information and give clear, noteworthy proposals to their partners.

To sum up, the whole risk management handle is contingent on organizational objectives being known and the critical risks being built up concerning those objectives. Not only hospitals but the pioneer's essential objective is to play out the exercises stipulated in lawful directions and different commitments (Oliva & Kallenberg, 2003; Nordin et al., 2011; Steven, 2012). Moreover, public health organizations face risks like other organizations. These risks might be complicated and include different factors such as management structure, process, and governance, leading to negative impacts on business continuity, specifically in the UAE context. Such factors are the line with the investigation of the current study. Based on the above discussion, it is inferred that there is a big gap in the existing body of literature based on the risk dynamics like risk management process, risk management culture, risk management governance, and business continuity from the context of Tawam Hospital as working in UAE. Meanwhile, the mediating effect of management commitment is also observed as missing in the current literature from the context of risk management components and business continuity.

1.3 Problem Statement

Risk management is an important issue that should be given utmost importance in the public sector (Ahmeti, 2017). However, different factors have been observed while play a significant role in determining the success or failure of the organization. Meanwhile, identifying and processing the appropriate risk management practices are required at different organizational levels. Besides, at different organizational levels, the conditions and effects of RM practices can be evaluated with the help of various techniques and mechanisms. However, the lack of understanding of this part creates an operational problem in the United Arab Emirates (UAE) public sector.

The United Arab Emirates (UAE) public sector was set up numerous decades ago. Nonetheless, there is no discussion about risk management culture because UAE public hospitals should be all-around prepared in terms of most recent risk management to withstand any difficulties that might arise (Farokhzadian et al., 2015). Neglecting risk management culture is a strategic issue since issues with risk

management culture are mainly related to the services provided to the shareholder (Schmitz et al., 2020; Bran & Vaidis, 2020). At the same time, less focus on RM culture may lead to issues in business continuity, specifically in public hospitals. In other words, risk management culture has been emphasized by past studies because inappropriate risk management culture does not help to prevent the occurrence of any future harm (Hao et al., 2020). Therefore, to have a better way of handling the situation, there is a need to have academic research on the risk management culture impact on business continuity which is currently not clear in the context of the UAE public hospitals.

For organizations in the public domain, the RM process is a current organizational administration device that tries to upgrade the consequences of business choices. The risk management process is essential for the success of the organization (Rahman, 2018). Past studies showed that the risk management process is essential for integrating with strategic business objectives (Hugo Hoffmann, 2020). Lacking a clear risk management process negatively impacts the implementation of risk management, leading to risk management failures. Meanwhile, such failures are common among underperforming organizations, including the healthcare sector (Ferdosi et al., 2020). However, there is no scholarly research focusing on the impact of the risk management process in public hospitals in the UAE, which is a genuine gap regarding public organizations in the United Arab Emirates (UAE). Besides, the risk management process assures how the risk observation and risk management state of mind of a bureaucratic organization's pioneer creates. Reprehensibly, not a significant number of research studies have been directed on this as far as the United Arab Emirates (UAE) point of view.

Another important factor of risk management is known as risk management governance. It is essential for risk management to take into consideration the technical ability to estimate the probabilities and impacts (Smith & Merritt, 2020) and the codification of risk management processes and decisions (Araz et al., 2020; Pournader et al., 2020). Any control system can react appropriately to the risks it was made for. In this way, as risks change should, control systems and be custom-made to the conditions experiencing changes. Risk management is likewise portrayed by the benchmarks and rules of public organizations and government establishments (Oliva & Kallenberg, 2003; Nordin *et al.*, 2011; Hubbard, 2020). However, the stated issues, specifically from the context of RM culture, process and governance dimensions, have

been widely neglected in the existing literature while observing public organizations like hospitals. Unfortunately, these issues are not being tended to appropriately in UAE public hospitals while focusing on the title of business continuity. In this way, the literature gap in the UAE public hospitals is an extraordinary issue confronted by business administrators.

All things being considered, risk analysis is coordinated at mapping the ranges and procedures that bear the most significant risk dynamics. The key objective of risk analysis is to sort the components as per the predefined risk criteria, which helps investigate the riskiest components, too (Oliva & Kallenberg, 2003; Nordin *et al.*, 2011; Steven, 2012). In this regard, UAE public sectors need that understanding to solve the existing problem, specifically in the form of RM practices. However, the question arises of how they would solve the problem without realizing the heat of the problem. So, there is a need for academic research to help determine the effect of risk management culture, process, and governance on business continuity in the UAE public sector, specifically in hospitals. With this as examined over, this research addresses the risk management apparatuses drilled in the public sector in the United Arab Emirates (UAE). Thus, it is worth looking at how risk management procedures can help in public hospitals in the United Arab Emirates (UAE) while taking into account the concept of business continuity

Despite the substantial amount of research in the area of risk management, no research has investigated the risk management and business continuity in UAE public hospitals, specifically the Tawam Hospital UAE. The core reason for selecting Tawam Hospital for the present study is that it is considered one of the largest public hospitals in the UAE and provides a range of services. Meanwhile, Tawam is a training and research hospital linked with the UAE University, Faculty of Medicine and Health Sciences (UK Essay, 2022). The hospital is currently owned by Abu Dhabi Health Services and combined with the health authority of UAE. As Tawam Hospital is currently providing a range of services to its clients and patients, managing various risk factors for the successful continuity of its business operations is not a simple phenomenon. Moreover, it is also observed that management of the risk factors in Tawam Hospital is significantly needed in order to continue its business operations (Almansoori, 2020).

In addition, the focus on Tawam Hospital is due to the increased pressure on the public sector hospitals compared to the private hospitals (Ferreira & Marques,

2020), which might create a potential risk to their business continuity. Also, public hospitals usually face a backdrop of decreased organizational slack (Trinchero et al., 2020), which requires awareness of risk management and management commitment to improving the business continuity of public hospitals.

Fundamentally, risk management is a natural process of public organizational management. Now, the question arises whether the public sectors in the UAE, particularly public hospitals like Tawam, realize the importance of RM practices based on their culture, process and governance dimensions. The handful of research on this important area, especially in the context of the UAE, shows the need for the current study to drill out the situation and show the way of improving it. Accordingly, the current study focuses on Tawam public hospital in the UAE as a case for the study in order to bridge the gap of lacking similar investigation in this area in the UAE.

In the final term, this study has highlighted that the need for quantitative data analysis is obvious from the context of public organizations like Tawam Hospital working in the UAE region. The reason for conducting the quantitative research design along with quantitative is that none of the existing studies in the field of risk management and business continuity has focused on this missing area. Hence a big literature gap is yet to explore and filled accordingly. For this reason, another issue has been observed in the existing literature regarding quantitative theoretical justification and empirical findings. Therefore, the current study has also provided new insight from the context of quantitative methods. The significance behind implementing the quantitative methods is that it helps in testing the relationship between the variables with the help of some advanced methodological contexts like structural equation modelling (SEM) techniques, whereas on the other side, research design helps in exploring a new insight specifically based on respondents' attitude towards the recent trends in the selected variables in any organization. Therefore, the current study has determined several research questions and objectives while taking the quantitative research methods with their proper implications. Besides, the justification for selecting the hospitals like Tawam as a major organizational concern is that existing literature has widely neglected public firms like hospitals while investigating the relationship between risk management culture, governance and process in justifying the trends in business continuity.

1.4 Research Questions

Based on the study background and problem statement, the current study has provided the following research questions. More specifically, research questions one to four primarily deal with the quantitative methods, whereas the fifth research question is based on the quantitative research design. This research has identified the following research questions:

i. What are the effects of risk management culture on the business continuity of public hospitals in the United Arab Emirates (UAE)?
ii. What are the effects of the risk management process on the business continuity of public hospitals in the UAE?
iii. What are the effects of risk management governance on the business continuity of public hospitals in the UAE?
iv. What is the mediating role of management commitment between risk management practices and business continuity of public hospitals in the UAE?
v. Which of the prominent factors is contributing towards the business continuity in the public hospital of UAE?

1.5 Research Objectives

To encounter the research questions, this study lists certain objectives as follows:

i. To determine the effect of risk management culture on the business continuity of public hospitals in the UAE.
ii. To determine the effects of the risk management process on the business continuity of public hospitals in the UAE.
iii. To determine the effects of risk-managing governance on the business continuity of public hospitals in the UAE.
iv. To determine the mediating effect of management commitment on the relationship between risk management and business continuity of public hospitals in the UAE.

v. To explore the prominent factors contributing to business continuity in the public hospital of UAE.

1.6 Research Scope

Data were collected from the staff of Tawam Hospital in the UAE to distribute the survey questionnaire face-to-face to the respondents to identify the employees involved in risk management activities. The researcher also put different sets of the study survey questionnaire in different offices. So, those respondents received the questionnaires in their offices and filled them out at their convenience. Afterwards, they returned the filled survey questionnaires to their main office, from which the researcher collected them. The questionnaires were distributed in Tawam Hospital in UAE. The total number of questionnaires distributed was 600. Of these 600 questionnaires, 297 were successfully retrieved. However, 24 questionnaires were void because the respondents chose more than one answer for one item. So, the total number of usable questionnaires was 273.

1.7 Significance of the Study

This section presents the theoretical and practical significance of the research investigation to enhance the current condition in public sector Hospitals in the United Arab Emirates (UAE). The theoretical contribution of the current study emerges from the investigation of the structure, process, and governance of risk management and business continuity of public hospitals in the UAE. The study outcomes are helpful for academics and scholars in this area. Considering that there is a lack of similar studies in the context of the UAE, the outcomes have provided an insightful understanding of risk management in public hospitals in the UAE.

1.7.1 Theoretical Contribution

Another theoretical contribution is that the presented research framework can be replicated in other contexts to investigate risk management components for improving business continuity not only in the Tawam Hospital in UAE but also in other sectors. Hence, scholars can use the proposed theoretical model to better understand the effects of management commitment to managing risks on the business continuity of organizations.

1.7.2 Practical Contribution

In terms of the practical contribution, the findings of this study provide a better understanding of the development of business continuity in the public health sector in the UAE. Therefore, decision-makers and policymakers in this sector can benefit from the current study findings to get a full picture of the variables that might negatively impact risk management so that they can take steps to overcome these challenges and make decisions. Also, the findings will help decision-makers to improve risk management evaluation in the public health sector in the UAE, which is expected to improve risk management implementation in public sectors. The significance of the current study can also be viewed from the context that it has applied quantitative methods for addressing the stated objectives and research questions, respectively.

1.8 The Thesis Instructions

Chapter 1 introduces the topic. It presents the background of the study, problem statement, research objectives, research questions, the significance of the study, and the scope of the study. The organization of all chapters for a complete overview of the study briefly concludes the chapter.

Chapter 2 reviews related literature and studies under different sections and sub-sections, as well as its variables. This chapter ends with the conceptual framework, which explains the study variables, followed by the development of the study hypotheses.

Chapter 3 discusses the research methodology. It presents the details of the methodology followed by the current research to achieve its objectives. The topics covered in this chapter include research design, research population, sampling technique, sample size, research instrument, data collection, and data analysis.

Chapter 4 presents the study findings from the analysis using SPSS and Structural Equation Modelling (SEM). So, this chapter includes the findings of the study objectives as well as the result of the hypothesis testing.

Chapter 5 presents the discussion, recommendations, and conclusion of the study.

1.9 Summary of the Chapter

This chapter depicts the context of the research study to provide a brief introduction, the background of the study, the research problem, the objectives of the study, research questions, and the significance of the study, followed by the outline of the study to highlight the way forward to the research process

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter comprises a comprehensive review of literature relating to business continuity, risk management and uncertainty, risk management principles, risk management process, risk management structure, risk management governance, concepts of risk, the benefit of risk as well as the limit of risk management in the public sector organizations regarding the context in the UAE.

2.2 Business Continuity Management

Business continuity (BC) in all circumstances refers to a condition of continuous, uninterrupted activity of a corporation. It focuses on individuals, property, systems, networks, suppliers' resilience, knowledge availability, and honesty. Some hazards are inevitable and are not within the capacity of the agency or company to tackle natural disasters entirely. The failure to stay operational and continue to provide government services is a key strategic concern for the department and its business areas. Therefore, the only step that can be taken is the planning of business continuity and disaster recovery plans (Jain et al., 2020). Business continuity management is a crucial mitigation factor as it strengthens the stability of the department in response to and

recovery from incidents that may interrupt business activities (Moşteanu & Roxana, 2020).

Business continuity is a holistic method that recognizes possible threats to an enterprise and the effects on business activities (Griffith, 2018). It brings about organizational resilience through a good structure that can respond efficiently to the needs of critical stakeholders, credibility, brand and value-creating activities (Azadegan et al., 2020). It is an ongoing management and governance mechanism assisted and sufficiently resourced by top management to take the needed measures to assess any potential risk to the organization. BC is also meant to provide strategic solutions to ensure that product and service continuity is maintained through preparation, practice, maintenance, and review (Business Continuity Institute, 2015). Thus, business continuity operations collectively cover all facets and stages of business continuity management (BCM) (Business Continuity Institute, 2015).

Business continuity management is primarily about quality and risk management, with some cross-over into relevant areas such as governance, information security, and compliance (Mosteanu, 2020). Risk management is a valuable tool for business continuity as it offers a systematic way to identify business disruption sources and quantify their likelihood and harm. All business functions, activities, supplies, structures, relationships, and so on—which are critically important for achieving the company's organizational goals—must be evaluated and included in the business continuity plan (Păunescu & Argatu, 2020). Business Effect Analysis is also the widely accepted term for risk management in assessing the relative significance or criticality of these components, which in turn, guides goals, planning, plans, and other activities of business continuity management. Suppose no business continuity plan is implemented and the organization in question faces a serious threat or disruption that could lead to bankruptcy. In that case, the implementation and result may strengthen the survival of the organization and the continuity of business operations, if not too late.

The above discussion has made it clear that the title of business continuity is very much needed among various strategic objectives of business organizations, both public and private in nature. However, for achieving such strategic objectives, it is important to note that the role of risk management and its components is quite significant. Meanwhile, the nexus between risk factors and business continuity is yet

to be explored from the context of different organizations, specifically in public firms, which is a big gap in the literature to date.

2.3 Business Continuity Planning Concept

Planning for business continuity is used to identify the company's risks and weaknesses, the risk of disruption, potential impacts of time-sensitive priorities, strategic success, current control effectiveness, and efficiency and quality improvement strategies (Griffith, 2018). It considers risk over time when typical work environments lack elements such as assets, staff, or even processes.

Scholars such as Cerullo and Cerullo (2004), who carried out a comprehensive analysis of BC planning, have discussed various core concepts of the BC planning process. They concluded with four BP process keys understanding the market, risk assessment, preparing a business continuity strategy (BCP), and reviewing the plan. These primary points below are addressed.

In order to create a BCP, it is essential to understand the business of the organization as a whole. This understanding includes identifying the business objectives, defining essential inputs and outputs of the organization's systems and functions, prioritization of service, and process requirements (Cerullo & Cerullo, 2004; Sapapthai, Leelawat *et al.*, 2020).

In designing a BCP, the primary role is risk assessment in terms of risk. Risk assessment, analysis, and evaluation are critical early steps in identifying the probable and likely effects and related business disruption problems, determining risk appetite, and addressing the need for a BCP (Cerullo & Cerullo, 2004; Sapapthai *et al.*, 2020).

The next step is the preparation of a business continuity plan. The main output of the business continuity process is the BCP, which requires pre-defined and tested communication approved by the management and decision-makers. So, this strategy is used whenever there is an interruption in the business of the organization (Cerullo & Cerullo, 2004; Sapapthai *et al.*, 2020).

The final step is the check of the program. When there is a business interruption, the staff must understand and consider what they will face shortly. The employments of BCP need to practice their duties regularly to test the BCP, verify its

currency, affirm the required competency and trust, and test the assumptions that they have about the ability to access the resources (Cerullo & Cerullo, 2004; Sapapthai *et al.*, 2020). The BC preparation process is aimed at providing management personnel, as well as other stakeholders, with the comfort that the company has the potential to recover efficiently, safely, and as cost-effectively as possible if the worst happens.

The critical review of the business continuity plan reflects that it is based on organizing some critical information required for the business to sustain itself over a longer period. More specifically, the BCP title also reflects some essential functions for the success and sustainability of the business. Moreover, BCP is also based on disaster risk management for different organizations while achieving some better success over the long run. However, its literature implications are not very much in general because only few organizations were observed with some theoretical and empirical investigation, like small and medium enterprises (Kato & Charoenrat, 2018), higher education industry (Rasiah et al., 2020), information technology firms (Pramudya & Fajar, 2019), entrepreneurial perspective (Fabeil et al., 2020), and supply chain management (Azadegan et al., 2020). However, the literature is still lacking while exploring the title of business continuity from the context of public firms like hospitals and the healthcare industry.

2.4 Public Hospitals in UAE

The UAE. has developed a fascinating infrastructure of healthcare services according to recognized international standards (Al-Talabani et al., 2019). There are public and private hospitals in the UAE, administered and overseen by federal and emirate-level government bodies. Private healthcare organizations, like the New Medical Centers, provide specialty and full-spectrum care. These private-sector projects are very significant for the overall and long-term growth of healthcare in the UAE (Al-Saadi & Abdou, 2016).

The two emirates of Ras Al Khaimah and Fujairah distinguish themselves as leaders in providing quality health services. Eight top-class hospitals are among them, offering lucrative opportunities for international collaborations. The UAE.'s federal diversification strategy emphasizes healthcare growth and investment as critical

pursuits. The UAE. Vision 2021 states that "the UAE will continually invest in building world-class healthcare infrastructure, expertise, and services to meet the growing needs and expectations of citizens." In its Vision 2030 strategy, the Emirate of Abu Dhabi further explains, "The growth of the medical sector depends on large investments in technology that Abu Dhabi is in a position to make (De Jong et al., 2019)

Similarly, Dubai's 2015 strategy focuses on getting cooperation with foreign healthcare providers to "enhance health system planning to ensure accessibility, accessibility, and quality of services." What sets the UAE apart from other Gulf countries is that this vision is backed by substantial and strategic investments by the federal and individual-emirate governments to move the industry forward. UAE healthcare costs hit an unprecedented $16.8bn in 2013 alone. However, in crucial areas such as women's care, oncology, paediatrics, and diabetes care, the relatively small population of the UAE has impeded the government's establishment of specialty care practices. In addition, disparities still exist across the country within those areas. India, Thailand, and Singapore are among the countries where patients in UAE seek help for those treatments, and patients seeking treatment in North America are increasing. The capital transfer is critical as the International Medical Travel Journal reports that approximately $250,000 per visit is spent on Emiratis traveling abroad for care.

Nevertheless, rapid development in the healthcare sector to avoid the migration of patients outside to seek better treatments indicates that the UAE is making efforts to provide quality care in the region. For U.S. healthcare companies, this emphasis generates opportunities. Demands for expertise in medical supplies, facilities, and management services are high. This includes cardiovascular medical equipment, companies that can design and build hospitals, and healthcare agencies with experience overseeing and staffing general hospitals and specialty clinics (Klumpp et al., 2021). Supply chain management technologies can become another opportunity until the information technology infrastructure is in place. In both spheres, companies have plenty to sell to those intending to seek opportunities to improve the quality of healthcare services. Many U.S. health providers collaborate with the UAE hospitals to solve issues such as inconsistent prescription prices, obsolete medical malpractice policies, inconsistent licensing and insurance practices, unavailable medical records, and insufficient education and training in healthcare (Rodziewicz, 2022).

This does not diminish the fact that the UAE, through cooperation with U.S. businesses, has made tremendous progress in creating its healthcare sector. The Abu Dhabi Health Authority recently clarified that "collaboration with international brands such as John Hopkins and the Cleveland Clinic has made quality healthcare more accessible." The UAE. healthcare relationship is a crucial building block in the healthcare sector of the UAE. It should not be ignored for the first time by U.S. businesses entering the market (Ginter, 2018).

2.5 Difference between Public Hospitals in UAE and Other Countries

Countries in this region have a large population of expatriates from all over the world with rapidly increasing economies. Universal coverage is often available, but medical insurance is generally necessary. In five countries (UAE, KSA, Egypt, Qatar, and Bahrain), critical public health information is discussed as follows:

The United Arab Emirates healthcare system has a good ratio of doctors (2.5 per 1000 people) and $1600 per capita is funded annually. There are 70 hospitals and 150 clinics. The WHO ranked the UAE at 27 worldwide for its overall health performance in 2000. Since most employees are trained in Europe, India, Pakistan, and Middle Eastern countries such as Lebanon, Jordan and Syria, the U.S. and worldwide, the languages spoken too are varied. UAE citizens are entitled to free basic coverage in local hospitals via a healthcare system. However, foreign nationals in Dubai and Abu Dhabi require private medical insurance as the country moves toward a more privately supported way of working to obtain a more comprehensive coverage level.

The KSA has a significant public health system with a network of over 2,000 health centers and 200 hospitals. Many of the high-tech equipment is imported. For instance, people with particular needs or needing specialist cancer surgery often want to be treated elsewhere, such as in London, despite the area being considered a center of medical excellence. It has been compulsory for foreign nationals since 2002 to provide health insurance, most frequently arranged by their employer. There is a high ratio of physicians of 2.4 per 1000 people (the UK has 2.8), and the country spends 4.7 percent of its total GDP on healthcare, almost the same as India.

Hospitals in Egypt can be basic in terms of healthcare quality. Therefore, many foreign nationals and wealthier people prefer to be handled in Dubai or the UAE. Private medical insurance covering the treatment in the wider area is available. Instead of collecting invoices and claims through a medical insurance provider, several hospitals ask for payment upfront. Accessing care using insurance in a hospital will help keep out-of-pocket costs down. Like Turkey, the country spends 5.6 percent of its GDP on healthcare, which is at the lower end of the worldwide scale. Egypt has 2.8 doctors, approximately equivalent to the UK for every 1,000 inhabitants, and ranks 63rd by WHO for overall effectiveness.

The WHO has ranked Qatar as 44th in the world for performance. Qatar maintains a high-tech, well-funded, and well-staffed healthcare system. It has among the highest ratios in the country, with over 7 doctors per population of 1,000. Most doctors have been recruited from abroad, so it should not be challenging to find staff who speak your language, from English to Hindi. The government provides all citizens with a minimum standard of coverage through its healthcare system, but it is also mandatory to have private medical insurance for expatriates. Some expatriates themselves arrange this, but it is common for the terms of an employment contract to include this.

In the context of Bahrain, it has three major, well-regarded private hospitals and four state-run hospitals. Healthcare spending is 5 percent of GDP, which has risen recently. International people have access to universal healthcare coverage. Bahrain has one doctor per 1,000 people, one of the country's oldest healthcare networks. Moreover, the number of foreigners in Bahrain is about a quarter of the population, causing the government of Bahrain to put more pressure on the country's healthcare system to provide excellent healthcare services. The effective healthcare system in Bahrain made it to rank 42nd in the WHO classification.

2.6 Tawam Hospital in UAE

Al-Ain's main Academic Tertiary Care Teaching Hospital is Tawam Hospital. With 447 beds, it is accredited as a hospital. It serves as the National Oncology Referral Center and Breast Center Regional Referral Center, providing comprehensive

treatment to patients with cancer. Blood donation and home care programs are also provided. Tawam Hospital's leadership shows devotion and involvement and offers sufficient support in line with the priorities of SEHA to concentrate on strategic objectives.

Tawam Hospital is affiliated with John Hopkins Medicine in the SEHA healthcare system. During the last few years, it has received more than 96,000 patients in the emergency department and over 290,000 in the outpatient clinics were treated. High-quality patient care has been obtained due to streamlining and modernizing waiting time processes. Gregory Schaffer, CEO of Tawam Hospital, said, “Our goal at Tawam Hospital is to provide the best medical treatment to our patients in the most efficient way possible. Gregory Schaffer, CEO of Tawam Hospital, said, “Our goal at Tawam Hospital is to provide the best medical treatment to our patients in the most efficient way possible. That means that our procedures, services, and general operations are constantly checked so that we can make improvements and learn how we can provide even better service and care for our patients, visitors, and staff”.

In line with its efforts to develop services, Tawam Hospital has received several quality awards to recognize its contribution to excellence. The hospital received the Sheikh Khalifa Excellence Gold Award, SEHA Transformational Project Competition and Best Medical Research in 2013. Tawam Hospital has also received awards such as SEHA's Circle of Excellence Rising Star and Abu Dhabi Medical Distinction Award. Tawam Hospital is part of the SEHA Health System, owned and operated by the Abu Dhabi Health Services Corporation (SEHA).

2.7 Risk Management

There are many definitions for risk management by authors who provided their perception of risk meaning and its management. The definitions depend on the profession, project, and type of business (Samson, 2009). This section will discuss risk definition, the concept of risk management, the benefits, and the limits of risk management.

2.7.1 Risk

While several different risk meanings are commonly available, often incorporating industry-specific terminology, it is generally understood that if we know for certain that anything is going to happen, there is no risk associated with it. If there is an element of mystery surrounding it, then there is a chance (Azarenko *et al.*, 2009; Steven, 2012; Baines & Lightfoot, 2013). Danger includes all possible risks and opportunities for this report and its potential effect on the organization's ability to achieve its goals, or risk applies to the organization's threats and opportunities. The Norm classifies risk into two forms: strategic risk and operational risk (Durugbo, 2013; Benedettini *et al.*, 2015; Wallin *et al.*, 2015). Strategic risks contribute directly to an enterprise's strategic planning and management processes. These risks, as documented in the strategic plan, could dramatically affect the achievement of the vision and strategic goals of the company. They are high-level threats that enable the board or senior executives of the company to identify, handle, track and manage them. For risk treatment to be successful, these risks must be handled by more than one organization. Operational risks, taking into consideration the activities carried out by a particular division, branch or work unit or the goals of the individual programs or project management. It can directly impact the achievement of the company's strategic objectives. In general, organizational risks involve the supervision of the relevant senior officer in charge of the section, branch, work unit, or the relevant program or project board. These risks will require executive management to escalate in extreme circumstances.

2.7.2 Definition of Risk Management

Risk is the most used concept in the literature, with the word management referring to the risk management area. Although other terms are used, like uncertainty, the term risk is the most common in academic and management fields. Samson (2009) argued that risk is commonly familiar with risk management, while uncertainty is a general

term which might include risk as an element. The current study will use the term risk, which has different definitions.

Winch (2002) concluded that danger is a stage where knowledge is missing, but it is easier to predict the future by looking at experiences. Cleden (2012), who claimed that risk is the declaration of what may emerge from the lack of information, offers another concept of risk. Risks are information gaps that we believe constitute a danger to the project. Smith *et al.* (2006), who argued that threats exist where there is some awareness of coming events, offer another concept. Similarly, Webb (2003) claimed that risk is a scenario in which we have some objective data on what the outcome could be so that we can either positively or negatively assess risks.

All of the above meanings define risk as a situation where the lack of any element can trigger danger to the project. The factors most often pointed to by all the writers as leading causes for a loss are lack of details and expertise. The definition given by Cleden (2012) best suits this study's intent; it concerns how risk is described as an information gap that will constitute a threat to the project if not treated correctly.

The word risk management (RM) is developed from the term risk. A detailed overview of the notion of RM and how it can be used in practice is given by Smith *et al.* (2006). According to the authors, risk management should not be viewed as a method to forecast the future because that is quite unlikely. Instead, they explain it as an instrument to promote the project in order to make better choices based on the investment details. This way, it is possible to avoid decisions based on inadequate knowledge, leading to better overall results.

RM is represented in the literature as a process with some predefined procedures. The extent of its meaning varies among the authors; however, the core data is the same. The essence of this term comes from a variety of concepts that can be found in the management literature explained by Cooper *et al.* (2005): "*The risk management process involves the systematic application of management policies, processes and procedures to the tasks of establishing the context, identifying, analyzing, assessing, treating, monitoring and communicating risks".*

Hillson gives another similar definition, and Simon (2020) defines risk management as the process of using the required tools and techniques to identify, assess, and manage threats and opportunities. This definition views risk management as an opportunity because the management can save the organization from issues or failure. The definition given by Hubbard (2020) states that risk management refers to

managing expected or current threats to the organization, which can be financial or non-financial. Similarly, Smith *et al.* (2006) argued that risk management is the systematic way of managing any issue through identification, assessment, analysis, and response.

The above definitions have defined risk as a threat and risk management as the systematic process of dealing with these risks that might affect the organization. Therefore, the current study will employ this definition because it is consistent with the context of the study and its investigation. However, from the context of different organizations, a critical review of the current literature has revealed that the management and controlling phases for risk management may differ. More specifically, some organizations are focusing on risk identification, risk measurement and risk controlling, whereas some firms consider risk definition, risk assessment, risk treatment, and finally, the reporting and monitoring of stated risk factors. Moreover, risk is a core factor linked with different organizations having different dimensions.

2.7.3 Benefits of Risk Management

The risk management process (RMP) should be continually established throughout the project to optimize risk management (Smith *et al.*, 2006; Hubbard, 2020). RM's incentives are reserved not only for the project itself but also for the participating actors. Clear perception and knowledge of future risks in the project are the principal rewards. Other advantages include increased control over the whole project and more successful problem-solving procedures. This results from an overview of project circumstances already at the start of the project. Risk management also offers a tool to reduce potential and sudden surprises (Cooper *et al.*, 2005; Fekete et al., 2014). The cultural differences between organizations in terms of dependency on organization policies and internal procedures might explain the differences in the attitudes towards risk (Webb, 2003; Moşteanu et al., 2020).

Many market methods can be differentiated within the RM. The risk-natural company, which does not spend much on risk management but is still conscious of the most severe risks, is one strategy (Katanaeva *et al.*, 2020). The second strategy is the risk-averse approach, in which no investment is made to minimize the possibility of a

risk happening. The risk-seeker is another strategy in which the company is prepared to face all threats and is often referred to as a gambler. Risk-seeking firms can achieve lower profitability in the long term relative to risk-natural firms (Katanaeva *et al.*, 2020). This is due to significant investments, and losses replicated repeatedly in risk management systems to ensure that all risks have been addressed before the risks arise (Winch, 2002; Hubbard, 2020).

2.7.4 Limitations of Risk Management

The risk level is often related to the size of the project (Darnall & Preston, 2010). The bigger the project, the greater the number of possible risks that could be experienced. Several variables can trigger the incidence of risk. The most frequently listed in the literature are financial, environmental (the surrounding environment of the project, location, and general regulations), time, design, and efficiency. The level of technology used and the enterprise's risk are other factors in the occurrence of risk (Peixoto et al., 2016; Hillson & Simon, 2020).

Complexity is another issue. The larger and more complicated a project is, the more resources are needed to finish it. In addition, the project team must note that there may be more threats after all possible hazards have been detected (Cleden, 2012; Emblemsvåg, 2020). Therefore, the project team members need to focus on the specific risks and consider the possible risks that might interrupt the business. Also, RM must be used to identify risks to be encountered in the future. Still, project managers should be prepared for any other potential risks so they can manage them even if they are not provided in the risk management plan

2.8 Risk Management Concepts

Within the context of risk management, several concepts can be distinguished which play a key role in understanding and conducting a risk assessment. Common approaches to risk assessment view risk as:

$$Risk = Probability(scenario) * Impact(scenario) \quad (2.1)$$

To clarify the different concepts that come into play when discussing risk assessment, an overview of the concepts is depicted in Figure 2.1, based on the bow-tie method described by Hopkin (2012). The bow-tie method depicts: This makes the bow-tie model ideal for providing a comprehensive overview of risk management concepts

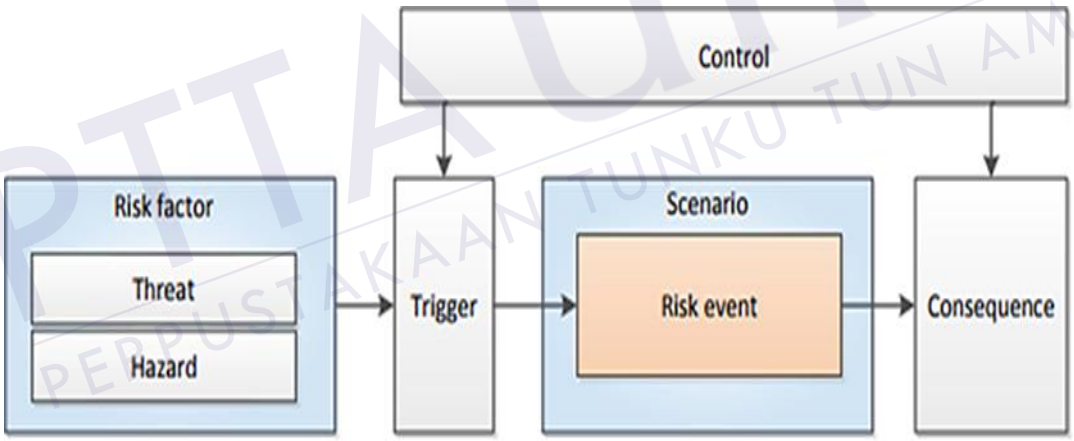

Figure 2.1: Concept of Risk

Risk management involves identifying hazards and threats (also known as risk factors). When triggered, these risk factors result in a risk event. The risk events have consequences, which should be identified. Examples of risk events are losing control of the car or traffic incidents. These events usually bring along certain consequences, like a damaged car. Both proactive and reactive controls (measures) can influence the impact and probability of triggers and consequences. An example of proactive control could be installing new tires.

On the one hand, this will have a minor effect on the impact of the traffic incident. On the other hand, it will possibly reduce the probability of losing grip on a slippery road and prevent a traffic incident. A reactive control could, for example, be having proper insurance to decrease the financial impact of the damaged car.

The above discussion has made it clear that the concept of risk management has covered various perspectives for which the above figure provides some comprehensive understanding. However, a critical review justifies that more justification as linked with the conceptual meaning of the risk management concepts still needs attention specifically from the context of public organizations, which are taking a major share in terms of community serving.

2.9 Risk Management Principles

According to Hopkin (2012), several principles lay at the foundation of risk management. The main principle is that risk management should deliver value, which means that the activities are designed to achieve the best possible outcome while at the same time reducing the uncertainty of outcomes. Furthermore, Hopkin (2012) mentions that successful risk management should be: comprehensive, systematic, structured; dynamic, iterative, responsive to change; and proportionate to the level of risk.

Rausand (2013) compiled a comparable list aimed at risk assessment. He adds that a "(risk analysis) process should be transparent and understandable by all stakeholders to whom the report will be presented". This principle is relevant since a vague or underdeveloped analysis could result in an unclear situational view, resulting in inefficient mitigation of risks. Since risk management is a dynamic and iterative process, the occurrence probability of events and incidents changes due to new risks that emerge or adapt because of existing risk dynamics (Bex & Hovestad, 2016). This can be illustrated by, for example, the track accident, for which a set of risks and controls is defined. However, the probability, impact and risks can change as the accident occurs. To perform solid risk management, it is vital not only during the preparation phases but also during the identification and analysis of risks and controls,

as well as during the occurrence of an event. Possible risks and controls should be evaluated against the current situation (Bex & Hovestad, 2016).

Greuning and Brajovic-Bratanovic (2022) have covered a comprehensive overview of risk management principles, specifically from the context of financial terms. It is inferred from the corporation context that the governance factor plays a significant role in determining risk management and related principles. Moreover, another critical argument has been reflected in the research work of Frączkiewicz-Wronka et al. (2021), who claim that public health organizations are constantly working under stress and regularly striving for survival. However, for this purpose, the role of risk management practices and principles must be examined carefully. Therefore, observing the trends in the financial stability of public health organizations under the shadow of risk management principles is quite an important phenomenon. A final verdict claim that better and sustainable risk management practices may lead towards better stability in the public health organization. Hence, the success of public firms like hospitals is impossible without considering risk management practices and principles.

2.10 Risk Management Processes

Risk management is sometimes a misunderstood term, in which there are misconceptions about the relationship between different risk management and other risk management processes. An important distinction that must be made when talking about risk management is the difference between risk management and risk assessment. Often, these terms refer to the same process; however, risk management consists of more than solely a risk assessment. To classify and clarify the risk management processes, a risk management standard, as depicted in Figure 2.2, has been developed by Irm/Alarm/Airmic/Airmic (2002).

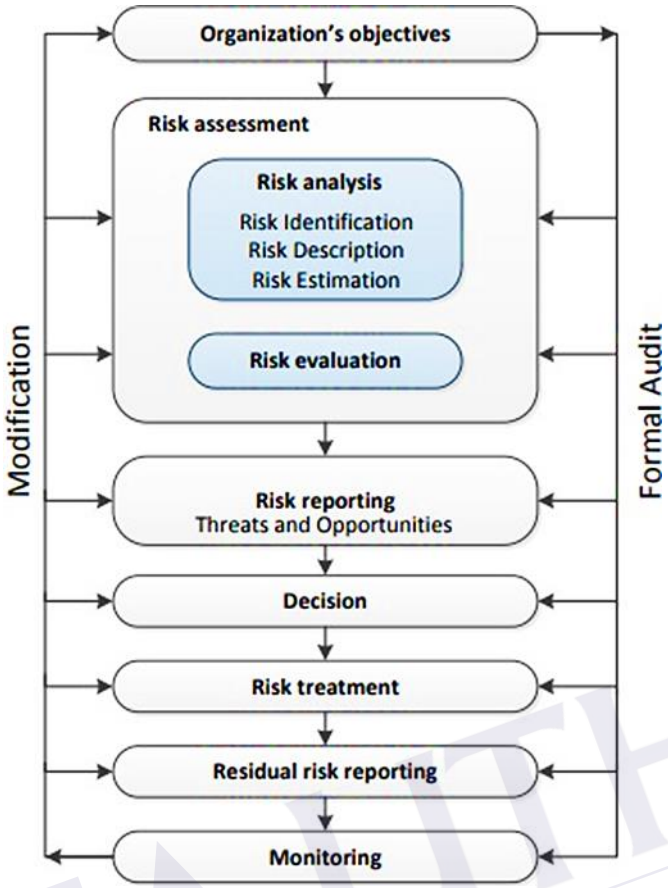

Figure 2.2: Risk Management Process Framework (Irm/Alarm/Airmic/Airmic, 2002)

Figure 2.2 clearly shows that the overall risk management process consists of multiple sub-processes; in turn, the risk assessment process also consists of sub-processes. Starting at the top of the model, the first process is to perform a risk analysis consisting of risk identification, risk description, and risk estimation. After the risk analysis, a risk evaluation compares the actual risks against the estimated risks. Subsequently, the threats and opportunities created by the stakes are reported to decision-makers, who decide whether the risks are worth treating. The report on the decision-making process includes a discussion of the residual risk. Finally, the monitoring process ensures that the appropriate controls are in place to mitigate the risk.

2.11 Risk Analysis

Risk analysis involves risk identification, description, estimation, and evaluation. The first step is the risk identification process, which allows the early determination of possible risks that influence the probability and impact of a scenario. Several methods and tools are available to guide this process, such as brainstorming sessions, questionnaires, expert judgment, and analysis of the organization's documentation and data (Hopkin, 2012). In addition, Hopkin (2012) mentions that more complex tools and methods exist, such as fault tree analysis and flowcharts. The most commonly applied risk identification techniques are summarized in Table 2.1.

Table 2.1: Risk Identification Techniques

Technique	Description
Questionnaires and checklists	Use of structured questionnaires and checklists to collect information that will assist with the recognition of the significant risks
Interviews and brainstorming	Collecting and sharing of ideas during interviews or brainstorm sessions to discuss
Flowcharts and fault tree analysis	Analysis of the processes and operations to identify critical components

They should be listed after risks have been identified. The purpose of the risk description is, for example, to view the defined risks in a standardized format using a table. It is possible to use this table containing risk definitions to promote risk evaluation. A well-designed framework is essential to ensure a robust risk recognition, definition, and evaluation process. Identifying and describing risks does not help understand risk. Therefore, the risks have to be analyzed to gain insight into the possible causes of risk. Different quantitative and qualitative tools are available to analyze the dangers in the risk estimation stage. However, a method or tool is often not exclusively qualitative or quantitative. Nevertheless, there is a difference in how the methods and tools are most commonly applied. Most of the findings of the different risk assessment methods and tools are based on the work by Rausand (2013).

The quantitative methods and instruments are based on a basic risk assessment model, which includes two risk factors: likelihood and effect. Such variables are evaluated, and non-numerical values are assigned. They can include, for example, high, medium, or small (Anghelache et al., 2009). Although these approaches and techniques are relatively basic, it has been demonstrated to be useful for decision-makers. Where numerical data is incomplete or inaccessible, resources are scarce, e.g. budget or skills, and the time allowed is reduced, a quantitative risk evaluation is always carried out (Anghelache *et al.*, 2009). In addition, a qualitative risk assessment is often performed to follow up on a quantitative risk assessment if it is deemed necessary, useful, and feasible (WHO, 2009).

A qualitative risk assessment method uses a structured what-if scenarios technique (SWIFT). The SWIFT method is a systematic brainstorming session involving experts with in-depth knowledge of the study objective. The expatriates set up a checklist containing topics to gather information on and raise what-if (or how-could) questions to identify possible risk events, causes, and barriers. Subsequently, suggesting alternatives to mitigate risks. When applying SWIFT to the example above of construction workers preparing roadwork, a question could be phrased as "what if the roadwork is extended past the set time limit?" or "how could an accident occur? During road work?" By asking these questions, both risks and causes could be identified. An adapted version of the risk matrix can support this method by serving as a tool to determine the frequency and severity of a risk event. Hazard and operability studies (HAZOP) have similarities with SWIFT. Moreover, SWIFT can be used to quickly identify the risks for which it would be worth the investment of conducting a HAZOP (Card et al., 2012).

The list of guidewords is often extensive, but we keep it basic. In addition to the guide words, some process parameters are defined, e.g., time and speed. During the brainstorming sessions, the HAZOP leader stimulates the discussion by asking questions, considering the guidewords and process parameters. Such questions are, for example, "what could happen other than a driver ignoring the speed limit?" or "what could happen after the predetermined deadline is exceeded?" The answers to these questions can help uncover risk events, causes that can trigger a risk event, and possible consequences. Subsequently, frequency and severity values of risks can be estimated and plotted on, for example, a risk matrix to compare the risk of a risk event with acceptance criteria.

To identify the causes and effects of a risk event, the failure mode, effects, and criticality analysis (FMECA) method can be applied. The FMECA method grew out of a similar method: the failure mode and effect analysis (FMEA) (Liu et al., 2019), and it has its origin in quality engineering. As can be deduced from their method names, the main difference between these two methods is that FMECA includes a criticality analysis. The added value of the criticality analysis is that it allows the addition of the risk priority number (RPN), computed by summing the frequency, severity, and detectability of a failure mode, i.e., risk event. Including the RPN enables the prioritization of risks and can support decision-making. To conduct an FMECA, cause and effect diagrams can be used as a standard and easy qualitative tool that requires no extensive training. A cause-and-effect diagram uses a "graphic fishbone" to depict the cause-and-effect relationships between a risk event and its associated causes (Liu *et al.*, 2006). The cause-and-effect relationship is shown in Figure 2.4.

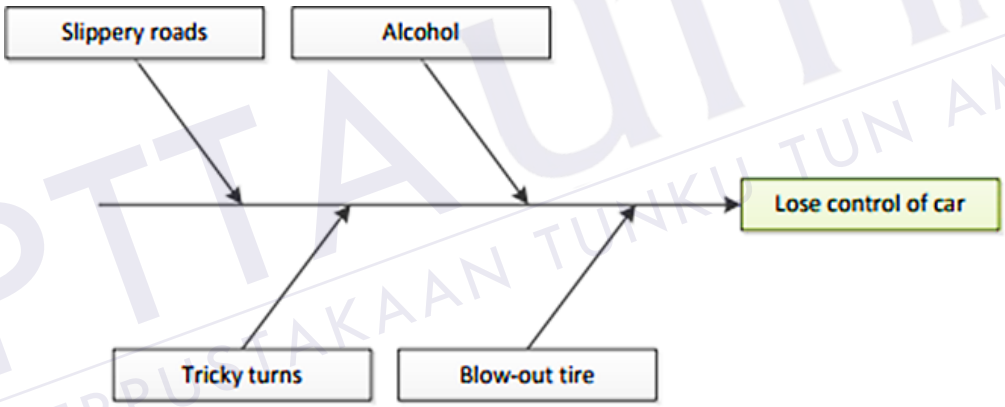

Figure 2.3: Cause and Effects Diagram

In this diagram, the causes which can result in the effect of "losing control of the car" are depicted on the left-hand side, while the associated effect is presented on the right-hand side. In this example, the cause-and-effect diagram is rather simple. In practice, the different causes will possibly also consist of sub-causes. Using a cause-and-effect diagram, risk assessor(s) are provided with a means to understand and interpret risks easily.

However, a different kind of approach to risk assessment exists, which is based on argumentation. Krause et al. (1993) describe work to develop sound qualitative methods for risk assessment. Such methods can express the reliability and accuracy of the evidence concerning a potential risk. Different approaches to the state of evidence

concerning risk estimates exist. It is essential to understand that risk classifications are often tailored to the organizational context of risk. In their work, Krause *et al.* (1993) focus on the carcinogenic risk of chemical compounds and thus use classifications specific to that field. The general point that can be extracted from their research is that arguments for and against identified risks should be used when analyzing risks. Having constructed relevant arguments, a risk report can be generated based on the available evidence. The risk analysts can then ask for further explanations of known risks to generate additional explanations.

2.12 Risk Matrix

Risk matrices are commonly used for different risk forms as a guide. Several risk assessment principles advocate using risk matrices (Yu et al., 2020). In the form of a graph, a risk matrix renders a likelihood and a consequence axis. Axes, ranging from low to high, are divided into many groups. This matrix's resolution depends on the number of categories along the axes and is an arbitrary choice by the matrix author. Both qualitative and quantitative labels can be assigned to the axes.

Consequently, in the case of quantitative marks, the categories may not be linear. A percentage is used for the probability axis for quantitative labels, and the axis of outcomes is usually expressed in monetary terms. Another scale may be used, such as accidents or reputational harm, depending on the form of risks plotted in the risk matrix. Several cells are generated by the two axes, each representing a range of probabilities and a range of consequences. Colors or numbers are frequently used to show each cell's acceptability to increase the danger matrix's visibility. For this reason, colors and numbers ranging from green or 1 (acceptable) to red or 5 (unacceptable) are used most frequently and can be added arbitrarily to any cell. In Figure 2.5, a risk matrix is shown.

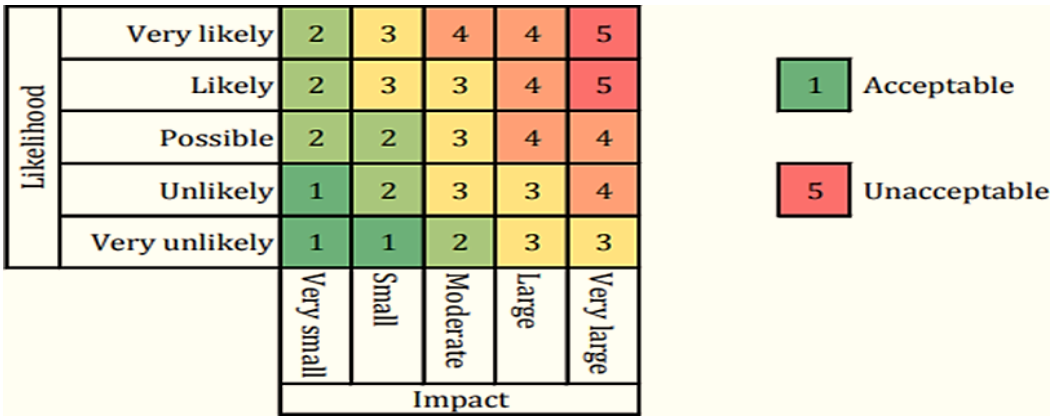

Figure 2.4: An example of a 5-by-5 risk matrix

The danger matrix is not always symmetric concerning the diagonal. This can be explained by the fact that the continuum of and category can be randomly chosen. As these risks have an irrecoverable impact, they can effectively never be grouped with reasonable risks. The acceptability index can also loosely outline which control measures should be taken to mitigate risk (Qazi & Akhtar, 2020). A red cell suggests that danger is unacceptable and should be treated, moved, or terminated immediately. A risk located in an amber cell is temporarily acceptable, but it should be considered for short-term treatment or transfer. A danger situated in an amber region can also be acknowledged. Risks in a green cell may be tolerated or handled, depending on the impact and probability.

Although the use of risk matrices is commonplace, its easy use has many drawbacks. Risk matrices are prone to poor resolution, as only a rough indication of the probability and consequence of risks can usually be given. Therefore, Anthony (2008) presented a list of drawbacks, including (a) risk matrices are prone to poor resolution, as only a rough indication of the probability and consequence of risks can usually be given; (b) risk can be assigned to a completely incorrect level of probability or consequence due to the range used per category, and (c) risk reactivity. It is possible to avoid these risk matrix limitations by assigning a definite value to each segment of the risk matrix. Even a quantitative approach leaves space for mistakes due to the organization's assignment of probability subjectively.

2.13 Risk Responses

A proper response to each risk needs to be implemented after evaluating the specific risks. Termination (avoidance), medication (reduction), transfer (sharing) and tolerance (acceptance) are possible responses (COSO, 2004; Hayne & Free, 2014). The risk responses are explained as follows:

Terminate: fully shut down all activities that activate the presence of the threat. This occurs when producing a particular commodity, for instance, is no longer viable for profit. A business may opt to stop making the product in this situation.

Treatment: directly reducing one or both the impact and likelihood of the risk. For example, fire risk can be handled by independently minimizing the effect or the likelihood. A curative action is taken to reduce the impact of the fire, usually with no effect on the likelihood of harm. Installing a sprinkler installation could do this. On the other hand, preventive measures may be taken to decrease the fire risk. Typically, this is achieved using fabrics impregnated with fire retardant agents to prevent flames from bursting into the material. The preventive measure, in turn, does not always directly influence the effect of the risk.

Shift: a complete or partial reduction of the risk's effect or possibility by a complete transfer or sharing of risk. An insurance policy is an obvious instance of this answer. An insurer can be approached to cover the liability for a specific payout if an entity or individual cannot cover the impact of a risk.

Tolerate: keeping the risk as is without taking any action. This can be achieved when, before or after introducing different risk responses, a risk is of insignificant size, is considered acceptable, and cannot be further referred to. Otherwise, a risk of considerable magnitude may be accepted if the risk is vital for an organization's survival and continuity. Any remaining and accepted risks should be controlled as they should not develop from a reasonable risk tolerated to an unacceptable risk.

To address a particular risk, an organization may choose which answer or combination thereof should be used. The organization should weigh risk tolerance and the effects of the available responses on the organization at a wide level to decide the best response to risk. Chances resulting both from the bare risk as to the answer and a cost-benefit analysis should also be taken into account.

2.14 Making Risk Management Decisions

The move that generates value for a company in the risk management cycle is primarily the selection of appropriate risk responses to counter risk (Hubbard, 2020). This option is also a case of optimization for financial risks. The aim is to find a balance between the expense of the reaction to be applied and the residual risk after implementation (Qazi & Akhtar, 2020). This leads to a person who is more lenient about taking the risk of finding a tolerable risk. A risk may be terminated depending on the decision-maker.

The theory of decisions is part of the theory of probability that deals with the estimation of the effects of unknown decisions. This can be used to state a choice's objectivity and optimize decisions. Several aspects of decision theory will be addressed in this chapter, i.e., risk appetite, risk attitude, expected benefit, expected utility, and loss aversion.

A clear definition of risk appetite enables a consistent methodology within an enterprise to manage hazards. The concept of risk appetite is the amount of risk that an individual is prepared to tolerate in search of value at a broad level (COSO, 2004). Risk attitude, which defines the inclination to risk-averse, risk-seeking, or risk-neutral behavior, is another term associated with risk appetite (Qazi & Akhtar, 2020). Risk attitudes can be communicated from the upper staff of an organization down to the other staff, which needs to be provided quantitatively by using risk appetite, which reflects risk-taking behavior.

The expected value of EV is the sum of all options with n possible outcomes with possibility p and consequence x for each possible outcome. An impartial decision-maker should be indifferent if the expected value of both options is similar (Sarkar & Singh, 2020). From this, it is possible to use the anticipated benefit to determine the agent's risk attitude. EVs are the expected value of the option to acquire a quantity of x and EVr is the expected value of the risky option to gamble. Using the expected value to calculate the indifference of an agent between the two alternatives, it is impossible to understand why indifference is obtained when this would not be so for an impartial agent. Another approach to indifference is employed, expected utility, to describe this phenomenon.

In economics, utility is used as a measurement of happiness and can also express the satisfaction of a particular choice in decision theory (Brandtner et al., 2020). This can be done by comparing the various options so that the decision-maker can be happy with a specific choice, which makes the decision process less risky (Qazi et al., 2018).

In terms of loss aversion, individuals usually take a decent size gain rather than risk a possible big gain and are willing to take a gamble to prevent a specific loss (Brandtner *et al.*, 2020). This leads to the aphorism that "losses loom greater than profits," which means that for most people, in the sense of utility, the satisfaction gained from receiving any particular amount of money is less than the sadness that is felt when that particular amount is lost.

2.15 Risk Management Culture

The risk culture has emerged from the global exposure of behavioral failures. The risk culture can be described as the standards of the financial institution and its people's collective attitudes and behaviors that affect risks and impact performance (Ernst & Young, 2014). Risk culture offers a particular lens for general cultural considerations to concentrate on risk-taking and risk-management practices. Many companies can observe a change in the atmosphere of the business and the atmosphere of the business as ERM implementation progresses. One clear difference is a constructive emphasis on threats rather than a reactive approach.

Other improvements are connected to increased responsibility and accountability. Managers are more accountable for risk management and controls with ERM in place because they help define threats and controls (IRM, 2012). When techniques and metrics are built to help handle a hazard, leadership may be held more responsible. One non-profit organization mandates a management action plan for any risk above a certain level. This rise in responsibility and transparency in the company will flow down to lower levels. A further transition could be from the viewpoint of "We need to comply" to "We need to manage this risk to achieve better results." One software company is attempting to construct a risk management thought process in the production of all new products; this initiative has resulted in a shift in culture and

thinking about the role of risk management. "Other cultural changes could occur, such as a shift from "blaming" to "identifying and managing", a shift from "do not report bad news" to "report as soon as possible" (so that the risk can be managed) and from "How does this affect my area or unit" to "How does this affect the risks of the entire company. Figure 2.6 displays the Risk Culture Model.

Figure 2.5: Risk Culture Model

2.16 Risk Culture Mechanisms

The risk culture model of Ernst and Young (2014) combines four fundamental elements of cultural structures that affect and help to determine a sound culture of risk: leadership, organization, risk structure, and rewards. Each is connected to mechanisms of control that need to be in place and function efficiently.

a) Leadership: delivering the right message: integrating the acknowledgement of desired actions with the tone from the top and center of the company.

b) Organization entails responsibilities and tasks, and governance. Creating the right environment integrates the management of risks (roles, obligations, and accountabilities) with the risk management standard.

c) Risk framework-taking the suitable risks involve risk appetite (the way it is set, integrated, and monitored) and risk transparency, including the organizations' general openness to various points of view.

d) Incentives: having the right motivations involves the employee life cycle, including rewards and other incentive mechanisms, from recruiting to training and management.

2.17 Benefits of Risk Culture to Organization

As indicated by Smith-Bingham (2015), risk culture has a range of benefits, and he maintained that a sound risk culture retains value and increases efficiency in three ways.

Perhaps, most importantly, it helps avoid accidents that can destroy corporate reputations. It is increasingly easier for consumers today to exchange feedback on the level of service they have offered and to cooperate in pursuing solutions for victims of industrial accidents or product recalls. Regulatory oversight has risen in many industries, and a lower tolerance for wrongdoing can be reflected in stiffer fines and stricter provisions. Equal customer relations are high on the oversight agenda, and many companies face a strong drive, where possible, to eliminate barriers to consumers switching suppliers. As a result, the strength of business risk management is gradually priced into investment decisions by shareholders.

A good risk culture helps to mitigate exposures resulting from increasingly complex operating practices (often made possible by technical advances) and the complexities of properly tracking them. For active risk management, organizations in many industries deploy multifaceted, interdependent structures that rely heavily on employee judgment at all levels. By the same reasoning, through recklessness, incompetence, or precise adherence to insufficient procedures, people or small groups are able to unwittingly create massive liabilities.

A strong risk culture creates efficiencies that result in margin improvements. Good operational discipline in industrial companies can minimize downtime and improve efficiency by predicting possible accidents and providing the workforce with a safer climate. In addition, reducing the number of injuries will mean lower payouts

for workers, fewer regulatory fines, and less need for customer reimbursement. As their safety record demonstrates, companies with good risk cultures will substantially discount insurance rates for operating exposures.

2.18 Sustainability Theory

The concept of sustainability theory is widely recognized in the recent literature while covering a vast horizon from the context of business, industry, regional and global perspectives. Sustainability is regarded as a capacity to maintain or improve the stated and availability of desirable conditions over a longer period. Meanwhile, the stated term has also been utilized to reflect the continuity of business operations for a longer period without hurting the natural resources. For this reason, the term sustainability helps focus on different organizational and natural and social resources while working for the betterment of the business and environment. Many studies have been observed while creating a link between business continuity and sustainability. For example, Jain et al. (2020) have created an integrated linkage between risk management and business continuity under the shadow of sustainability. It is inferred that proper integration of risk management and business continuity would help achieve better results while taking the shadow of sustainable business practices.

In addition, Corrales-Estrada *et al.* (2021) have expressed their views regarding business continuity as a core organizational dimension that cannot be described without considering the sustainability perspective. Their empirical findings contribute various perspectives. A significant relationship exists between risk management to business continuity, innovation and sustainability. Moreover, it is further expressed that the idea of business continuity cannot be determined without considering the sustainability perspective. Miller (2011) has also claimed that sustainability is widely integrated into the strategic planning of business continuity. Besides, Syed (2019) also investigates the need for business continuity, risk management, and assessment through sustainability theory. It is inferred that business continuity management would be quite beneficial if there is a proper integration of various risk dynamics.

Based on the above arguments and stated findings, it is inferred that current research has considered the sustainability theory as an underpinning theory from the

context of business continuity and risk management dynamics, specifically in the Tawam Hospital, UAE.

2.19 Risk Management and Decision Theory's Common Ground

The risk assessment and decision theory cases have been presented. Understanding these expertise fields helps them find their common ground at an intersection. The most striking similarity is that, without the existence of uncertainties, both risk management and decision theory will not work. In addition, there are many parallels when the risk assessment technique is further analyzed. Risk management helps evaluate and prioritize risks that decision theory may take with the latter. Risk management allows decisions to handle risks, whereas decision theory will recommend the best course of action to cope with uncertainty if there is knowledge of the decision risk-taking maker's conduct.

To prioritize risks in a similar way to the risk matrix, decision theory can be applied. When adequate information on the risk-taking behavior of the decision-maker is available, the quantitative risk matrix of the decision-maker can be predicted by measuring the utility of the cells in the risk matrix, each representing a set of risks. The outcome may be used as a priority indication, with risks having higher priority in cells with the highest absolute utility than risks of lower absolute utility.

2.20 Decision Influencing Factors

Using the methods mentioned above, people's choices can be evaluated. The personality and characteristics of the decision-maker affect these decisions. This section will address which characteristics affect risk-taking behavior and how risk-taking behavior demonstrated in non-financial fields can be used to determine risk-taking behavior in financial fields.

2.21 Domain-Specific Risk-Taking (DOSPERT)

It is well-known that risky behavior is also likely to be seen in other areas, such as sports and exercise; for instance, gambling. DOSPERT (Domain-Specific Risk-Taking) is a psychometric scale used to measure the perception of risk using five domains: financial, health, recreational, ethical, and social decisions. In one or more of the above domains, a person might do various activities on a seven-point scale. The result of the analysis shows the indicators of risky activities.

There is also a risk-taking sub-domain in the financial DOSPERT, which might help to analyze risky financial backgrounds, including the investment of 10% of your annual income in a mutual fund for moderate growth, betting a day's income on horse races, and investing 5% of your annual income in a very speculative portfolio.

2.21.1 Demographic and Socioeconomic Factors

The effect of demographic and socioeconomic variables such as age, gender, and income status on risk-taking conduct has been the subject of several studies. Research on these variables is often performed using a questionnaire, although questions about the efficacy of this methodology have been raised. It is said that questionnaires do a bad job of predicting real investment behavior and have little association with reality (Hubbard, 2020). This allows one to confirm or falsify earlier research findings with a new approach. In efforts to study demographic and socio-economic factors influencing risk-taking decisions, there appears to be a positive correlation between being more risk-seeking and the following (Grable, 2013): gender; age; color; marital status; work experience; income; financial awareness, and higher education qualifications.

2.22 Factors Affecting the Business Continuity of Public Hospitals in the UAE

Today, most facilities that provide immediate medical services provide a business continuity plan for hospitals. In the UAE, having a healthcare business continuity plan is not just a moral or business decision. The Health and Human Services Department demands that healthcare companies have a "comprehensive strategy of testing and monitoring to prevent and manage downtime events." A business continuity strategy for hospitals is by no means a "once and done" project.

2.22.1 Management Commitment to Risk Management

A clear board-level safety policy, maintenance of high safety standards, and top management dedication to safety require a corporate approach to safety (Sadgrove, 2016). Management engagement is one of the main factors in determining the role of management in the climate of security risk.

Management responsibility and airline safety transparency, for example, are primarily embedded in the Convention on International Civil Aviation, the requirements set out in Annex 6 to the Convention and the subsequent application by the Contracting States of the International Civil Aviation Organization (ICAO). In general, these include (Byron, 2001): setting an overall implementation strategy for functional operational managers; meeting the specifications of the air operator certificate (AOC); being open to the safety system; setting and specifying company safety standards; checking that everybody recognizes and acknowledges standards; and ensuring that deviations from standards are identified, recorded and corrected. A management duty for contesting the consensus may be added to this list. Organizations with strong safety cultures typically agree that the appropriate approach of a leader to unanimous consensus is to take an alternative view to facilitate thorough dialogue (NASA, 2003). As the leading figures of the organizations, the Chairman, President, and Chief Executive Officer (CEO) have supreme accountability, authority, and responsibility for safety management (Choi & Cho, 2020).

Despite banking operations increasing diversity and complexity, financial institutions are exposed to numerous risks, including credit, business operations, information technology, legal, settlement, and other risks. BanBanks recognize the conduct of risk-adapted operations and the management of such risks recognizes the conduct of risk-adapted operations and the management of such risks as a critical issue relating to overall management. Banks maintain robust risk management and control mechanisms to execute their business strategies while ensuring financial stability. Hopkin (2018) attributed deficiencies in implementing risk management instruments and processes to a lack of dedication to leadership and collaboration due to a lack of resources, expertise, capacities, and influential organizational culture. Prevalent causes of weak risk management are poor organizational culture and faulty corporate governance. The risk maturity area discusses organizational capacity issues affecting risk management instruments and processes. It has developed a range of risk maturity models (RMMs) that define the causes, conditions, and mechanisms that assess the ability of an organization to achieve risk management goals (Hoseini et al., 2019; Mahama et al., 2020).

A company retains the basic risk management policies set out by its Board of Directors that apply to the whole community. These policies identify the types of risks to be handled, develop the organizational framework, and include the requisite human resources training for adequate risk management levels. The policies also allow for evaluations to assess the system's efficacy and appropriateness for risk management. They maintain several steps in line with these basic policies to reinforce and increase the complexity of their risk management strategy (Katanaeva *et al.*, 2020; Mahama *et al.*, 2020).

It is impossible to underestimate the value of the contribution of managers to risk management. Danger (safety) management involvement is a prerequisite for effective organizational crisis management initiatives. Several scholars have concluded that top management engagement is an important element of effective crisis management and a key indicator (Wijethilake & Lama, 2019; Mahama *et al.*, 2020; Mashi et al., 2020).

The above arguments have clarified that the management commitment towards risk management practices primarily determines the continuity of public firms like hospitals and health units. However, one of the critical gaps, as observed in the existing literature, is that it is lacking while addressing the trends in risk management practices

and organizational commitment towards them both in public and private organizations. Moreover, the nature and the management perspective of the different risk factors are also observed with heterogeneity in different firms. This is due to the nature of the business. Additionally, top management plays a vital role while dealing with some strategic planning regarding sustainability and resource management. Such practices reflect a higher level of management commitment towards changing marketplace dynamics. Meanwhile, it is also observed as a critical factor to claim that management commitment is necessary for sustainable business operations. However, the literature is unable to explore the dynamics of management commitment towards risk management and business continuity is yet to be explored from different public sector organizations.

2.22.2 Risk Management Culture

Risk management has always been a top priority concern for financial institutions in terms of performance enhancement, competitive advantage, and growing value offered to shareholders (Krause & Tse, 2016; Schmitz et al., 2020; Bran & Bran & Vaidis, 2020). Risk management is one of the most important veins of sustainability, the accomplishment of strategic goals, and an essential determinant of progress in financial chaos, as is well indicated. In this line of thought, because of its ongoing assessment of environmental risks, financial businesses approach risk management as a strategic method in their everyday operations and crisis preparedness, identification, and prevention.

The only thing that researchers agree on is that doing business implies risk-taking (Cortés et al., 2020). Since risk management plays a role in the company's profits and losses, the value produced and given to shareholders is directly related to risk management practices (Elahi, 2013). Shareholders aim to have higher returns in lending or investing their money. They foresee, but at the same time, managers take risks; they refrain from investing in organizations that would be extremely risky for these returns. The risk management strategy stems from the challenge of fulfilling shareholder demand for higher returns without losing shareholder faith.

Establishing a sound risk management culture is of strategic significance to the effectiveness of risk management. According to internationally recognized financial market regulators, such as the Institute of International Finance (IIF), one of the key reasons why many global banks and other financial institutions have faced the disastrous economic situation of the recent crisis is that they do not have a proper risk management culture strategically developed. On the other hand, institutions with a good risk management culture can potentially solve the crisis and overtake their rivals. It is clear that the establishment, management, and assessment of risk management cultures is both a daunting challenge and a source of competitive advantage for today's financial institutions.

Risk management culture refers to traditional norms and principles relevant to organizational risk recognition, management, and evaluation (Domańska-Szaruga, 2020). Risk management culture is also an organizational concern (Elahi, 2013) and needs to be planned according to strategically identified risk attitudes and behaviors to achieve corporate goals. Companies must incorporate empirical and predictive risk evaluation methods and familiarize workers with the common vocabulary and tone of action in detecting and managing risks. All these factors thus make the culture of risk management a strategic problem. Risk management culture should find its place in strategic planning to recognize toes and behaviors linked to the risks faced and to integrate risk management culture within the business.

In addition, risk management culture has also been investigated in the healthcare industry, for which the research contribution is provided by Slemon et al. (2017). They have claimed that risk management culture also plays a major role in mental health and nursing practices. It is finally claimed that risk management culture is a major indicator towards the success or failure of the healthcare unit. Despite the substantial amount of research in the area of risk management, however, there is no clear evidence for research or study that has investigated risk management and business continuity in UAE public hospitals, specifically the Tawam Hospital, UAE. Therefore, this research set to bridge that gap; after the conclusion of this research work, a conceptual framework was developed based on risk management and business continuity in UAE public hospitals.

2.22.3 Risk Management Governance

Risk and risk management activities constantly influence decision-making and actions. The scope of risk management in organizations has grown dramatically over the last few decades through developments in the technological capacity to estimate probabilities and impacts (Smith & Merritt, 2020), the codification of risk-based decision-making and management processes (Araz et al., 2020), and the recognition of risk management organizational processes (Pournader et al., 2020).

Risk-based decision-making has been advocated as an efficient and fair way for public and private entities to use scarce resources to mitigate risk. By exposing the conditions that lead to organizational failure and its avoidance, including organizational and structural causes, the related field of safety science has significantly affected risk management (Hubbard, 2020). The definition of 'safety setting,' individual and shared security behaviors, and 'safety culture,' the shared sense structures, have highlighted the importance of organizational culture for preventive risk management (Sharman et al., 2020).

Many studies have shown ties between healthy climate initiatives, organizational culture, and safety efficiency, according to Kalteh et al. (2019). Organizational culture also has a vital role in avoiding organizational dysfunction and failure, which has greatly affected safety and risk management research (Boin & Fishbacher-Smith, 2011).

From another perspective, risk management mainly focuses on identifying the potential risks along with the evaluation of these risks, such as the risks related to regulation, financial matters, and regulation issues. Risk-based decisions frequently have to balance risk against benefits and losses and must consider multiple priorities and values (Hugo Hoffmann, 2020). Risk management deficiencies are widespread regardless of the use and implementation of risk management instruments and regulations. Many organizations, such as healthcare providers, still face different obstacles in risk management (Ferdosi et al., 2020).

The International Risk Governance Council (IRGC) investigated risk management, and the experts stated that there are two types of risk management (Hopkin, 2018). The first is concerned with risk perception and evaluation, and the second type refers to the willingness of companies to incorporate risk management

instruments and procedures to achieve the desired results. As initially conceived—by measuring attributes of organizational maturity through organizational structure, policy, business processes, and culture—the method seeks to quantify an organization's capacity to influence a business process.

Based on the size and nature of its risk exposures, each entity takes appropriate risk management steps for its corporation, while the government controls risk management for the agencies and departments as a whole (Hubbard, 2020). Any organization's risk management framework is the combination and flow of communication between the risk management role of the organization (Duffy, 2020). The Risk Management Committee, headed by the Chief Risk Officer (CRO), provides the company with integrated control and management of the overall risk. Depending on how the hierarchies are labelled, the CRO periodically reports the risk management situation to the Board of Directors, the Risk Committee, the Executive Management Committee, and the CEO/MD/ES/DG as appropriate. The head/center office periodically receives reports and inquiries from our core group companies on the risk management situation and provides them with practical risk management guidance. Each department or organization maintains its risk management framework for different types of risk, regularly receives reports on the risk status of its respective subsidiaries and offers appropriate risk management guidance to them.

According to Sadgrove (2016), the structure of risk management can be subsequently divided into three lines of protection for business organizations. They argued that the lines clearly explained the divisions, department responsibility, and risk ownership in the company.

Danger owns and maintains the first line of defiance. Contrary to how risk management is viewed, risk or compliance practitioners do not own individual risks and the controls that reduce them. Instead, general management and senior management are accountable for ongoing activities. The activities include owning and managing risks; detecting, evaluating, and minimizing risks; enforcing corrective actions; implementing and retaining internal controls; performing internal control assessments; regular execution of risk and control procedures.

The second line of defiance supervises threats. This line of defense is available where risks are available. These functions include ensuring that organizational management and senior leadership take the appropriate risk management activities. This line also assists risk owners in evaluating risk information accurately, and the

workers in this line deliver reports regarding the risk and resilience of the organizations.

The Internal Audit forms the third defensive line, and his work aims to guarantee the success of governance, risk management, and internal controls. This line assesses the efficacy of the first and second lines in the protection process and the efforts to attain the risk management objectives. This line also supports the organization's risk management and internal control system.

To conclude, risk and risk management activities are constantly influencing corporate governance. Risk-based decision-making has been advocated as an efficient and fair way to use scarce resources to mitigate risk. Each entity in the organization takes appropriate risk management steps for its corporation, while the government controls risk management for agencies and departments. The Risk Management Committee, headed by the Chief Risk Officer, provides the company with integrated control and management of the overall risk. These complementary efforts of the whole organization with its different levels show the importance of governance to overcome the problems that might arise from any potential risk through good management that makes plans and ensures their effective implementation.

2.23 Conceptual Framework and Hypothesis

The conceptual structure consists of interlinked principles that provide a holistic explanation of a phenomenon under analysis. The ideas that form a conceptual framework help each other, express their respective phenomena, and create a theory that is unique to the framework. Conceptual structures, however, hold ontological, epistemological, and methodological assumptions. Each concept plays an ontological or epistemological position within a conceptual context. The ontological assumptions concern the perception of the "way things are," "the nature of reality," "real life", and "real behavior" (Abubakar *et al.*, 2014). In an assumed reality, the epistemological assumptions refer to "how things really are" and "how things really work". The methodological assumptions contribute to the process of constructing the conceptual structure and analyzing what the "real" world can tell us.

The researcher developed the following framework to guide this research; it combines dependent and independent variables and mediating variables, as shown below. The independent variables (IVs) are risk management culture, process, and governance. These IVs are used to study their impact on the dependent variable (DV) Business Continuity of public hospitals in the UAE. Also, the study used the variable management commitment as a mediator to investigate its mediating role in the relationship between the IVs (risk management culture, risk management process, and risk management governance) and the DV (Business Continuity of public hospitals in the UAE). Figure 2.7 shows the conceptual framework of the study.

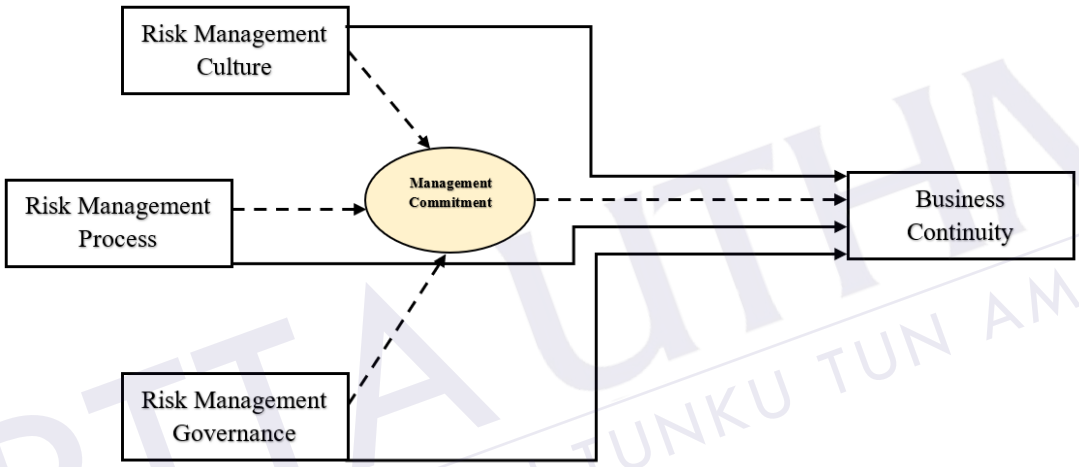

Figure 2.6: Framework of the Study

Based on the above figure, the following hypotheses of the study are formulated:

H1: Risk Management Culture positively impacts the Business Continuity of public hospitals in the UAE.

H2: Risk Management Process positively impacts the Business Continuity of public hospitals in the UAE.

H3: Risk Management Governance positively impacts the Business Continuity of public hospitals in the UAE.

H4: Management Commitment significantly mediates the relationship between the risk management culture and business continuity.

H5: Management Commitment significantly mediates the relationship between the risk management process and business continuity.

H6: Management Commitment significantly mediates the relationship between risk management governance and business continuity.

2.24 Summary of the Chapter

This chapter reviewed the literature on risk management, advantages, disadvantages, processes, principles, and risk matrix. The next chapter will focus on the research methodology employed in this research.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter clarifies the research methodology followed in the current study to achieve the study objectives. The chapter presents the study's various methodological topics, including research philosophy, research design, population, sample, sampling technique, research instrument, validity and reliability of questionnaire survey, and data analysis.

3.2 Philosophical Perspectives

A research paradigm provides a context through which a researcher operates, according to Padgett (2016). Therefore, the research structure is a fundamental belief system that directs researchers or investigators. Each research methodology is, therefore, part of a paradigm that assures that every researcher needs to follow the rules and standards of a specific research paradigm (Johnson & Onwuegbuzie, 2004).

It is well-known that any research model gives specific constraints the researcher is expected to follow as a guide for their research (Sarantakos, 2012). Hence, every research needs to follow the research constraints that clarify which research methodology to be followed in carrying out any research. These constraints

start from the study questions that aim to investigate a specific phenomenon, the extent of control necessary in a particular research context over behavioral events, and the philosophical role of the researcher (Creswell, 2013).

According to Tuli (2011), the research paradigm has three dimensions: ontology, epistemology, and methodology. Ontology is related to what happens and the world's existence. Epistemology is a philosophy that discusses how to gain knowledge of external reality. Tuli (2011) has pointed out that ontology focuses on truths sought. Two essential research methods are positivist and interpretivist (Lindlof & Taylor, 2011). The positivist approach is quantitative. However, both philosophical approaches have, in one way or another, positive and negative effects on various study contexts, but the core problem is the same (Yanow & Schwartz-Shea, 2015).

3.2.1 Positivist Approach

A scientific paradigm refers to the application of methods of natural science to the study of a particular phenomenon. This approach seeks to view facts as empirical and something that can be measured and discovered by a neutral researcher. This position has also been referred to as positivism and has been used until today (Henderson, 2011; Cohen *et al.*, 2007). Various scientific techniques produce numerical and alphanumeric methods (Sritanyarat *et al.*, 2010). The positivist framework is connected to the reality of social phenomena or their causes (Hussey & Hussey, 1997). In this research paradigm, investigators applied the vocabulary of theories, variables, and hypotheses. Data for this process were compiled and arranged into quantifiable variables.

Positivism ensures that psychological studies should be conducted similarly to those in which physical phenomena are treated (Tuli, 2011; Henderson, 2011; Cohen *et al.*, 2007). They believe the observatory must remain isolated by maintaining a distance from subjects (research participants) under observation. Social science research must be unbiased to make generalizations. Typically, researchers using the positivist approach remain unbiased, involve a formal writing style, and use the impersonal passive voice and technical terminology (Tuli, 2011; Henderson, 2011; Cohen *et al.*, 2007).

The empirical methods used in the positivist approach were initially developed to study natural phenomena in the natural sciences. The most popular quantitative approaches used in management information systems are survey methods, experimental experiments, systematic methods, and numerical methods (Sritanyarat *et al.*, 2010; Hussey and Hussey, 1997).

3.2.2 Interpretive Approach

Some schools of thought say that, since the 1960s, the interpretive paradigm has emerged. It was founded on the conviction that it is not possible to interpret the world as an objective reality. (Leitch *et al.*, 2010; Petty *et al.*, 2012; Kapoulas & Mitic, 2012). quantitative purists are sometimes called constructivists and interpretivism and thus advocate "the dominance of constructivism, idealism, relativism, humanism, hermeneutics, and sometimes postmodernism" (Leitch *et al.*, 2010; Petty *et al.*, 2012; Kapoulas & Mitic, 2012). According to purists, time- and context-free generalizations are neither desirable nor acceptable. They contend that it is impossible to fully differentiate the causes and effects on which precise generalizations are based. In this regard, Leitch *et al.* (2010) and Petty *et al.* (2012) noted that compared to a separate, more formal writing style of the quantitative method, quantitative writing styles offer a comprehensive description with rich information.

Researchers at the school of thought believe that only subjective interpretation and intervention can ultimately make it possible for researchers to truly understand reality (Leitch *et al.*, 2010; Petty *et al.*, 2012; Kapoulas & Mitic, 2012; Hussey & Hussey, 1997). The underlying concept behind this principle is that the best positioning in social settings creates a more significant opportunity to understand people's opinions on their activities. Knowledge is gathered and interpreted, and the data extrapolated from that information is based on hypotheses. In Table 3.1, a summary of the major contradictions between these two methods is listed.

Table 3.1: Main features of positivistic and interpretivist research paradigms

Positivists	Interpretivist
Use large sample size	Use small sample size
Researcher does not get involved into	Researcher gets involved into
Problem domain	Domain
Location is artificial	Local is natural
Data is precise	Data is subjective
Concerned with hypothesis testing	Concerned with theory development

3.2.3 The research approach adopted in this study

This research study aimed to identify the factors influencing the risk management tool evaluation at Tawam Hospital in the United Arab Emirates (UAE) and to explore the relationships between these factors. A hypothesized model of Risk Management Tools Practice in Tawam Hospital was built based on different theories and models in the field of technology adoption, as seen in the conceptual context of the study in chapter two. This research used the positivist (quantitative) method to empirically test and validate the hypotheses in the proposed model because it was compatible with the topic. In reality, under a positivist approach, Hussey and Hussey (1997) proposed that the usual process is to review the literature to create an acceptable theory and build hypotheses.

For several factors, this research analysis was thus within the domain of the positivist approach rather than that of the interpretivist approach. Firstly, the theories are developed after a detailed review of the literature in the field. By gathering data through self-administered questionnaires, these hypotheses will then be tested. Therefore, the researcher is isolated from the problem domain (Collis & Hussey, 2013; Hussey & Hussey, 1997; Hussey & Smith, 2010). Secondly, in the study process, the role of the researcher remains impartial. Finally, this approach is acceptable because it facilitates cost-effective data collection, offers a solid theoretical emphasis for analysis, and provides data that can easily be compared. Based on these factors, it can be said that this research was carried out from the viewpoint of a positivist to study

risk management and business continuity in the UAE Tawam Hospital (Collis & Hussey, 2013; Hussey & Hussey, 1997).

3.2.4 Quantitative Study

The prepared sample questions were initially circulated among 5 experts to analyse the statements' accuracy based on the study objective. The opinions and suggestions of the experts have been used as a presting method (Olson, 2010) to ensure the questions' credibility. The experts in the present study consisted of three (3) academics with research experience of over 5 years and two (2) experts from the hospital industry working on strategic positions. In this regard, the stated number of experts is observed as sufficient based on the suggestions from earlier studies (Presser and Blair, 1994). Based on the provided suggestions from the experts, the sample questions were determined to address the fifth objective of the study.

A case study research design accommodates a wide range of research methods. This means that the selection of various methods that the researcher wants to use should be purposive. Therefore, if the researcher feels that the questionnaire will elicit certain information better than the other methods that will be employed, then the researcher can proceed. Remember that the point of selecting data collection methods is to help in answering the research question. It is mostly employed as a quantitative data collection tool to answer the quantitative oriented research question. The questionnaire as a data collection tool could be used to collect data to answer quantitative-oriented research questions. A survey would certainly be justified if the goal is to test a hypothesis, and this research site is a good location to test that hypothesis. The same might be the case if the research was purely descriptive, so long as there was some reason why a description of this research site would be a clear contribution to knowledge. If the sample size is good and the topic is categorized in the literature as a less researched/sensitive topic in a way that grants access is challenging. Also, it depends on the aim and the type of research question. Suppose the question related to a unique case needs numeric data to be answered; this is another reason to combine a case study as a strategy and a questionnaire as a tool to extract numeric data. Suppose previously researched materials are not solid/ and have

ambiguity (mixed results across different companies/regions), which was reported to perform very badly recently. In that case, the study becomes a quantitative case study. The sampling will be purposive. Thus, all findings gained would explain only the organization/company (cannot be generalized).

3.3 Research Process

In addition, the research process in the present study was based on the key suggestions provided by Zikmund et al. (2013). In his research, the authors have provided a valuable framework for covering the research process based on the different interrelated steps. The details for the given steps as adopted under current research in terms of the research process are given as follows:

1. Defining the research objectives
2. Planning a research design
3. Planning a sample
4. Collecting the data
5. Analyzing the data
6. Formulating the conclusions and preparing the report

Considering the first step in the research process, as determined by Zikmund et al. (2013), it is stated that the definition of the research objective is very important. For this purpose, current research has provided some outstanding discussion under Chapter One, where the study background and problem statement were defined.

The second step in the research process was based on the consideration of the research design. For this purpose, the current study has applied quantitative research methods. Moreover, the current study applied a deductive research design, where the research framework is justified through existing theory.

Third, the current study explained an overall process related to the study sample and data collection. For this purpose, additional details have been provided in the upcoming sections of this chapter. Then, the sample data was collected with the help of survey questionnaire techniques from the Tawam Hospital in UAE. The stated sample size of the questionnaire will be explained logically in the upcoming section, along with the justification of the data being collected and tested, respectively.

In the fifth step, data analysis techniques is discussed for which descriptive statistics, measurement model testing through the CFA approach and structural model with the help of structural equation modelling techniques, respectively, whereas the last step in the current study in terms of research process covers the conclusion and report writing, respectively.

3.4 Design of the Study

A research design is a research project methodology used to analyze and find answers to research questions. Three types of research designs have been identified in the literature: exploratory, descriptive, and explanatory design (Creswell, 2013; Yin, 2013; Williams, 2011). In this study, exploratory research was used in the first step to gain background information about the research issue. Based on the literature, the investigator identified structures and formulated hypotheses. The research problem was clarified, and the purpose of the research was clearly described so that this study could focus on the risk management and business continuity of the UAE Tawam Hospital. The next step uses a descriptive research design to describe the respondents and determine the constructs' frequencies, percentages, means, and standard deviations. However, the descriptive analysis did not clarify the relationship between the variables; explanatory research was used to clarify the relationship and interaction between model variables (Toury, 2012; Englander, 2012).

The researcher used a quantitative method of data collection and a survey approach in this study to obtain data on risk management and business continuity in Tawam Hospital in the UAE. For the data collection, cross-sectional analysis using a survey method was carried out. The survey method was used because it interacts more directly with the respondents' thoughts, feelings, and perceptions, particularly when it concerns collecting information about attitudes and beliefs. In addition, the survey approach provides more detailed ways of analyzing sample information and helps the researcher to generalise the results from a sample to the population (Creswell, 2013; Yin, 2013; Williams, 2011).

In addition, the survey method is considered quick, cost-effective, reliable, and can be easily extended to a large sample (Toury, 2012; Englander, 2012). In addition,

a two-step approach to structural equation modeling (SEM) analysis was used in this research study. In the first phase, the measurement model was evaluated to analyze latent constructs' unidimensionality, validity, and reliability through confirmatory factor analysis (CFA). The structural model method was employed in the next step to investigate the hypothesized relationships in the proposed research model between the latent constructs.

3.5 Population

No accurate data on the risk management and business continuity of Tawam Hospital in the UAE is available. Therefore, the investigator approached the subjects before the investigator approached the study in various ways, such as through hand-to-hand distribution in the Tawam Hospital of questionnaires. Literature indicates that the whole community of subjects of interest identified by the research goals is the target population. However, a difference and differentiation between the population a researcher is seeking to analyze and the population available for sampling (Patrick *et al.*, 2011; Thompson, 2013). Thus, our target population in this analysis is the Tawam Hospital in the UAE. Furthermore, based on the researcher's statistics, the number of staff members at Tawam Hospital is around 3100—as he is a staff member at the hospital. Therefore, the population under study is the employees currently working at Tawam Hospital of UAE. Moreover, the analysis unit under this research was entitled as individuals, as the data were collected through different employees.

3.6 Sampling

People are likely to make assumptions about people, places, and many other things affecting their lives, often based on insufficient proof. Sampling is the selection process in which several people are selected to research in such a way that they can represent the wider population to which they belong. Using the survey, sampling aims to get information about the population. The more the chosen sample reflects the

population, the more generalizable the study findings are considered for the population (Scheaffer, 2011; Levy & Lemeshow, 2013).

There are also cases of study in social science where it is impossible to test all the participants of the community concerned. Due to the extensive hard work, time, and resources involved, examining all members of the selected population may not be practicable. In such cases, the number of participants in a manageable unit must be decreased so that the results derived from the ratio represent the entire population from which the sample is taken (Scheaffer, 2011; Levy & Lemeshow, 2013; Denscombe, 2014).

Sampling refers to reducing the number of participants to a manageable group (Teddlie & Yu, 2007). Sampling is also used in opinion polling and market research. It is also used in big and small-scale research projects. Thus, in any analysis, the decision on sampling is a significant step. If the selected population (sample) is not representative or biased, then the researcher is more likely to draw incorrect conclusions. In the social and behavioral sciences, the sampling process typically falls into probability and purposeful. Teddlie and Yu (2007) agree that there are currently four large sampling categories. Still, instead of going into the particulars of each of the four categories, the investigator concentrated on the same probability and purposeful sampling. In quantitatively focused studies, the former was used, while the latter was used in quantitative studies. Probability sampling techniques include "the random selection of a relatively large number of units from a population or from specific subgroups (strata) of a population, where the probability of inclusion is determinable for each member of the population" (Teddlie & Yu, 2007). In quantitative research, the main aim of probability surveys is to achieve representativeness to the degree that the sample accurately reflects the entire population.

The purposeful sampling technique can be characterized as selecting units (e.g. individuals, groups of individuals, institutions) based on particular purposes relevant to answering the questions of a research study. Purposeful sampling can also be seen as a method in which "specific settings, individuals, or events are intentionally selected for the important information they can provide that cannot be obtained from other choices". Since the present analysis is quantitative, this review has focused primarily on the different methods used in sampling probabilities.

3.7 Probability Sampling Techniques

There are three basic types of probability sampling, plus a group that includes several probability techniques, according to Teddlie and Yu (2007). Random sampling happens when each sampling unit gets an equal chance of being part of the sample in a clearly defined population. This sampling occurs when the researcher divides the population into subgroups (or layers) so that each unit belongs to a single layer (e.g., high-income, medium-income, low-income) and then selects units from those layers. Cluster sampling occurs when the sampling unit, including communities, hospitals, schools, or classrooms, is not an entity but a community (cluster) that occurs naturally in the population.

3.8 Random sampling

All have a chance of being part of the specimen in a random study. The sample is selected randomly without considering the non-random variables of the participants' availability, such as desire, age or ethnic origin. (Teddlie & Yu, 2007; Acharya *et al.*, 2013; Sincich, 2011). In random sampling, two methods are used: completely random sampling and systematic sampling. A researcher selected the subjects without considering any variables, i.e. age or gender, in the former sampling method and selected the sample randomly. In contrast, some basic rules in selecting a sample are in systematic random sampling. The uniform distribution can be achieved by systematic random sampling. This approach is because this sampling technique ensures that when the population is large, the selected sample represents the target population (Teddlie & Yu, 2007; Acharya *et al.*, 2013; Sincich, 2011). Therefore, due to the accessibility obstacles to the sample population, a systematic random sampling methodology was used in this study. The study participants were employees of the Tawam Public Hospital in the UAE.

For the purpose of collecting the sample from the desired number of individuals, the current study has mainly focused on the key suggestion of Krejcie and Morgan’s table, under which the relative size of the population and sample has been

suggested. More specifically, Table 3.2 provides the outlook for the graphical presentation of both the population and relative sample sizes based on Krejcie and Morgan's suggestions. For instance, if the desired size of the population is 3100, then the relative size of the sample is 341, as suggested.

Table 3.2: Krejcie and Morgan Simple Size Suggestions (Kenpro, 2022)

N	*S*	*N*	*S*	*N*	*S*
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note.—*N* is population size. *S* is sample size.

Source: Krejcie & Morgan, 1970

3.9 Data Collection Procedure

Data collection refers to gathering the respondents' opinions and information from the study participants according to the needs of the research objectives (Englander, 2012). There are different methods for data collection, such as face-to-face, online, emails, phone calls, and so on. The current study used different methods, including self-

administered questionnaires, e-mails, and postal mail, and these methods are considered to be reliable methods for data collection using different methods makes the process of data collection more flexible, cost-effective, and easier (Dillman, 2011; Touvier *et al.*, 2010).

The researcher in this study visited Tawam Hospital in the UAE to distribute the survey questionnaire face-to-face to the respondents to identify the employees involved in risk management activities.

An important step in the data collection process is that the researcher has received approval from Tawam Hospital in the United Arab Emirates (UAE) to collect data from their organization. They also put different sets of the study survey questionnaire in different offices. So, those respondents received the questionnaires in their offices and fill them out at their convenience. Afterwards, they returned the filled survey questionnaires to their main office, from which the researcher collected them.

The questionnaires were distributed in Tawam Hospital in UAE. The total number of questionnaires distributed was 600. Of these 600 questionnaires, several 297 were successfully retrieved. Besides, among these, there were 24 questionnaires in which the respondents' answers were not usable due to choosing more than one answer for one item. So, the total number of usable questionnaires was 273.

3.10 Survey Questionnaire

One of the effective methods for data collection is survey questionnaires because they are efficient and cost-effective methods of collecting data for the study. In the current study, the survey questionnaire has a cover letter to explain the study's main purpose and to ensure data collection confidentiality. The cover letter explained to the respondents that the current study aims to investigate the impact of risk management on business continuity in public hospitals in the UAE. It was explained that responding to the survey questionnaire is voluntary, and they have the right to withdraw from responding without any consequences. The cover letter also clarified that the survey respondents should be 18 years old and above. Also, the respondents were provided with the researcher's contact information, including their mobile phone number and

email, so they can contact the researcher if they have inquiries and want to know the survey result.

The survey questionnaire has two main sections. The first section gathers information regarding the participants' backgrounds, such as age, sex, education, and occupation. Meanwhile, the second section has the survey items according to the study's variables.

The questionnaire survey was distributed to the participants face-to-face, via email, and postal mail. The survey questionnaire was distributed with a cover letter to explain to the respondents that the participation is voluntary and that they have the right to withdraw. The cover letter also ensured the participants that their responses were confidential and would be used for research purposes only. To encourage participation in the study, the researcher allowed the respondents to get gifts such as notebooks and pens, so they were requested to leave their information at the end of the survey for the gift drawing. In terms of those who participated by answering the online survey, the gifted winner was contacted and provided with the gifts. The following section explains the survey development and production process used in the current study.

3.11 Development of survey questionnaire and measurement

The questionnaire development process needs artistic and scientific skills from the researcher's side to make the survey questionnaire clear to the reader and achieve the research objectives. The questionnaire needs to gather sufficient data about the problem under investigation. In the current study, the researcher did his best to make the questionnaire items clear to the reader so that they can respond to the questions quickly, which helps to gather accurate information for the study objectives. Also, the researcher made the utmost effort to organize the survey questionnaire so that the respondents did not have difficulty responding to the survey items and did not lose interest in responding to the survey.

According to scholars, questionnaires are effective in collecting data when they are well-designed, and the researcher knows the study problem and how to analyze the data to provide an understanding of the study problem (Sekaran, 2000; Zohrabi, 2013).

Accordingly, the research developed a questionnaire for the current study to gather data and answer the research objectives. The survey development in the current study included piloting, validity, and reliability, which are discussed in the below sections.

In addition, Table 3.3 to Table 3.5 provides the details for measuring the study variables. The selected variables' items have been measured through a five-point Likert scale.

Table 3.3: Measurement of Business Continuity

Dimensions	**Business Continuity**
Governance	1. In our organization, we have a business continuity plan (BCP)
	2. There is someone responsible for looking after business continuity management
	3. The business continuity plan is regularly updated
Bus Impact Analysis	4. Critical activities and resources required to maintain and resume work at any time are identified
Risk	5. Risks posing threats to our critical activities are always assessed and controlled
Bus continuity response plan	6. We have business continuity responses for the PEOPLE identified as essential to maintain business operations
	7. We have business continuity responses for the PREMISES identified as essential to maintain business operations
	8. We have business continuity responses for the technology identified as essential to maintain business operations
	9. We have business continuity responses for the operations identified as essential to maintain business operations
Communication	10. We have always been briefed with direct responsibility on the content of the BCP (training, induction, meetings, etc.)
	11. We have a method of communicating with our key clients

Table 3.4: Measurement of Risk Management Governance, Culture and Process

	Risk management Governance
1.	The management provides a common understanding of the objectives of each risk management initiative
2.	The management provides common terminology and a set of standards for risk management
3.	Policies and controls are implemented in response to risk analysis
4.	Provides enterprise-wide information about risk
5.	Enables everyone to understand his/her accountability
6.	Non-compliance to risk management practice is punishable
7.	There is a risk management function (Risk management Officer/Risk committee/Risk management department/Audit committee, etc.)
8.	Risk is integrated with key performance indicators (KPIs)
9.	Institutional leadership has a good understanding of the benefits of risk management.
10.	Institutional leadership is adequately involved in risk management practice
	Risk Management Process
1.	We have a formal procedure for identifying risks
2.	We are encouraged to identify risks at any level within the organization
3.	We effectively participate in institutional risk assessment
4.	We regularly update a list of risks in our work processes
5.	We regularly reprioritize a list of risks
6.	We effectively track and report any potential or actual risks
7.	We identify key risk indicators (KRIs) and analyse them
8.	We continuously monitor risk policies and controls for effectiveness.
9.	We have a process in place for reviewing and updating our risk management practices
10.	We have insurance policy(s) that cover our assets and people
Items	**Risk Management Culture**
1.	The values and norms of behaviour within the organization generally support effective management of risk
2.	Risk management is integrated into our corporate strategic planning
3.	Risk management is integrated across all functions and business units
4.	We are trained on how to respond to risk
5.	Risk management is aligned with our organization's objectives
6.	We have a common understanding and language around risk management.
7.	We effectively communicate risks with all relevant parties.
8.	We are all aware of our organization's risk appetite
9.	Roles, responsibilities and rewards are determined in keeping with effective risk management

Table 3.5: Measurement of Management Commitment

Items	**Management Commitment**
1.	Clearly identify risk management and business goals for achievement
2.	Ensure that risk management and business goals are known to every member of the organization and management team
3.	Ensure continuous efforts to enhance the quality of risk management and business performance
4.	Always a source for new ideas to enhance the quality of business undertakings
5.	Involve frequently in the risk management and business continuity process
6.	Strong willingness to change current work procedures to conform to the requirements of a standard system

3.12 Pre-Testing and Pilot Study

Piloting the study survey questionnaire is essential to validate the study instruments by ensuring that the survey is free of ambiguity and errors. So, pre-post piloting is essential to ensure the survey questionnaire's reliability and validity, and these steps must be done before the actual study (Sekaran & Bougie, 2016). Accordingly, the research made pre-post piloting before collecting the study's primary data. The main aim of piloting was to avoid confusion and misunderstanding of the survey from the respondents' side and to figure out any mistakes to correct before collecting the study's primary data.

3.13 Reliability of the Instrument

The pilot study in this research was used to ensure the reliability of the survey by testing its internal consistency through the test of Cronbach's Alpha using SPSS. The estimated value of Cronbach's Alpha is above 0.70 to be acceptable (Cohen *et al.*, 2007). This is supported by Sekaran (2000), who argued that a value of less than 0.6

is poor; a value of 0.7 is adequate, and a value of reliability above 0.8 is good. This shows that the closest the value of Cronbach's Alpha to 1.0, the better the internal consistency of the survey.

3.14 Structural Equation Modelling

Structural Equation Modeling (SEM) is a collection of mathematical models to illustrate and describe the interactions between several latent variables (constructs). Researchers can explore the relationship between multiple dependent and independent constructs at the same time with the help of the SEM approach (Hair *et al.*, 2006). As a result, SEM analytical approaches have been used in many fields and have become an essential instrument for academic science studies (Kline, 2005; Hair *et al.*, 2006). SEM is a multivariate statistical approach that allows researchers to examine a model's measurement and structural components by analyzing the relationships between multiple constructs. Therefore, structural equation modeling techniques were most suitable for this research study because it requires testing hypotheses of independent-dependent relationships, according to the proposed research model described earlier.

The SEM software package, Analysis of Moment Structures (AMOS), version 18, was used in this research study to examine statistical relationships between the test items of each factor and between the independent variables and the dependent variable factors: (a) SEM-AMOS provided a systematic framework for validating relationships between constructs and indicators and for testing relationships between constructs in a single model (Hair *et al.*, 2006); (b) SEM-AMOS provided efficient and robust statistical methods for dealing with complex models; and (c) SEM-AMOS validated the relationship between constructs in a single model (Hair *et al.*, 2006).

3.15 Measurement Model

Confirmatory Factor Analysis (CFA) is a SEM tool commonly used when there is some quantitative understanding of the organization's underlying processes and calculations (Byrne, 2010; Nordin et al., 2022). However, it is strongly recommended that, after exploratory factor analysis, confirmatory factor analysis (CFA) should be performed to check and validate the scales derived from EFA. Unlike EFA, CFA is a tool used to validate the a priori hypothesis of the relationship between the measurement variables set and their corresponding latent variables (Hair *et al.*, 2011; Hair *et al.*, 2016). To evaluate the measurement model, two main approaches are used in the CFA: (1) evaluating the fitness parameters (GOF) indices and (2) evaluating the validity and reliability of the measurement model (Hair *et al.*, 2006; Kline, 2005). Therefore, in this analysis, the investigator used the measurement model to test the measurements' unidimensionality, validity, and reliability, defined as follows.

3.16 The Goodness of Fit Indices

In Structural Equation Modeling (SEM), Hair *et al*. (2006) and Kline (2005) postulated that three significant categories of fit measure indexes exist: absolute fit indices, incremental fit indices, and parsimonious fit indexes. To calculate the total model fit power, the absolute fit indices are used, and these indices include the chi-square statistical likelihood ratio ($\chi 2$) and the fit index's goodness in combination with the root mean square approximation error (RMSEA) (GFI). The incremental fit indices are used to compare specific baseline models with the proposed model, and the incremental fit indices are the standard-fit index (NFI) and the comparative fit index (CFI) (Iacobucci, 2010; Kenny, 2010; Hair *et al.*, 2014). The parsimonious fit indices are used by specifying less calculated parameter paths to investigate whether the approximate model is simpler or can be enhanced. The Parsimonious Fit Index (AGFI) includes the Adjusted Goodness-of-Fit Index (Hair, 2011).

3.17 Model Estimates

Apart from the precision of fit criteria, other standardized statistics are often used for testing the measurement model. Approximate parameters include standardized regression weight (factor loading) and critical ratio, such as (cr). The cut-off point proposed by researchers for these estimates was used in this study as follows. The loading factor value should be greater than 0.7, but it is also necessary to provide a value greater than 0.5. Values of critical ratios should be above 1.96666 (Hair *et al.*, 2011; Hair *et al.*, 2016).

The measurement model describes the interrelationships between observed (indicator) variables and unobserved (latent) variables, as defined in the previous section. In other words, it describes and attempts to verify that each of its underlying structures (indicator variables) is covered by measurement objects (latent variables). CFA (measurement model) was then performed to identify and validate the pattern by which measurement objects were loaded onto a specific building (Kline, 2005; Hair *et al.*, 2016). The measurement model was evaluated using the estimation method for maximum probability (ML) given in the AMOS program (Tabachnick & Fidell, 2001).

The reasons for choosing this estimation procedure are discussed here. First, although the model does not meet the criterion for using at least five measurement objects for each construct (Hair *et al.*, 2006; Hair *et al.*, 2016), this approach is relatively suitable for medium-sized samples since some constructs in this study used less than five items. Secondly, in the case of a medium-sized sample, compared to other estimation techniques, the ML estimation technique is reasonably impartial in the light of moderate normality violations, regular data, and when the number of categories on the Likert scale is four or greater (Kline, 2005). Finally, in SEM science, since this approach minimizes the discrepancy between covariance and observed matrices, the ML method is also the most widely used estimator; as a result, the parameter estimates are improved (Kline, 2005; Hair *et al.*, 2016). Therefore, the measurement model was run in this study using the maximum likelihood estimation approach suggested by scientists. In addition to the precision of fit criteria, other standardized statistics are often used for testing the measurement model. The estimated parameters are standardized regression weight (factor loading) and critical ratio, such as (cr). The cut-off point proposed by researchers for these estimates was used in this

study as follows. The load factor value should be greater than 0.7, but it is also necessary to provide a value greater than 0.5. Values of the critical ratio should be above 1.9666 (Hair *et al.*, 2011; Hair *et al.*, 2016).

The measurement model describes the interrelationships between observed (indicator) variables and unobserved (latent) variables. In other words, it defines and tries to check that the measurement items apply to each of its underlying structures (indicator variables) (latent variables). To describe and validate the pattern by which measuring artifacts were loaded onto a particular building, CFA (measurement model) was then performed (Kline, 2005; Hair *et al.*, 2016). The measurement model was evaluated using the AMOS software's estimation method of maximum likelihood (ML) (Tabachnick & Fidell, 2001) to better understand the model fit indices. Table 3.6 provides a better outlook based on the above discussion.

Table 3.6: Model Fit Indices

Name of category	Goodness-of-fit indices	Acceptance level	Comments	Literature support
Absolute fit	Chisq	P > 0.05	Sensitive to sample size greater than 200	Wheaton *et al.*, (1977)
Absolute fit	RMSEA	RMSEA < 0.08	Range 0.05 to 1.00 is acceptable	Brownne & Cudeck (1993)
Absolute fit	GFI	GFI > 0.90	GFI = 0.95 Is a good fit	Jorekog & Sorbom (1984)
Incremental fit	AGFI	AGFI > 0.90	AGFI = 0.95 Is a good fit	Tanaka & Huba (1985
Incremental fit	CFI	CFI > 0.90	CFI = 0.95 Is a good fit	Bentler (1990)
Parsimonious fit	Chisq/df	Chisq/df < 5.0	The value should be less than 5.0	Marsh & Hocevar (1985)

3.18 Reliability

The accuracy, stability, and reproducibility of measurement results are concerned with reliability. It is the most critical determinant of the consistency of the measurement instrument because it helps to recognize the inconsistencies and their effects on the measurement results. In contrast, internal reliability is critical when several measurement items are required for each build (Sekaran, 2016).

The reliability of the measurement items was evaluated in the present study by measuring the accuracy of the respondent's responses to all the question items. The alpha reliability coefficients of Cronbach were used to determine each measure's internal accuracy. As indicated, reliability coefficients less than 0.6 were considered poor, 0.7 were acceptable, and coefficients greater than 0.8 were considered good (Sekaran, 2016). In addition, Hair *et al.* (2006) proposed that sufficient internal consistency is indicated by Cronbach alpha reliability coefficients of 0.7 or higher. Therefore, a minimum cut-off value of 0.6 was used for Cronbach's alpha reliability coefficients in the present study to determine the reliability of each measure to evaluate the overall reliability of each of the latent constructs used in the model.

3.19 Validity

Zikmund (2003) described validity as "a scale's ability to measure what it was meant to be measured." In other words, validity defines the degree to which a construct and its corresponding measurement measures are connected and the extent to which the construct they are meant to evaluate represents the collection of objects (Hair *et al.*, 2006). This implies that the accuracy of measurements is linked to validity, so the better the match between latent theoretical construction and measured objects, the more validity is defined. Thus, it is possible to evaluate the validity of the construction by testing convergent validity, discriminant validity, and nomological validity.

3.19.1 Convergent Validity

Convergent validity refers to the degree to which the observed variables share a high portion of the variance in general in a particular construct. To test the convergent validity of each of the constructs, factor loadings of a construct, average variance extracted (AVE), and construct reliability (CR) estimation are used. Furthermore, Hair *et al.* (2006) suggested that ideal standardized loading estimates should be 0.7 or higher, AVE estimates should be greater than 0.5, and to demonstrate sufficient convergent validity, reliability estimates should be above 0.7. Therefore, the minimum cut-off requirements for loads > 0.7, AVE > 0.5, and reliability > 0.7 were used in this analysis for the assessment of convergent validity (Hair *et al.*, 2006).

3.19.2 Discriminant Validity

The term "discriminant validity" refers to the degree to which a latent construct is somewhat different from other latent constructs. A method proposed by Hair *et al.* (2006) checked discriminant validity. It compares the average variance obtained for each construct with the corresponding square inter-construct correlations (SIC), and the AVE estimate is consistently more significant than the SIC estimates, implying support for the discriminant validity of the construct. This approach was used in this study to assess the discriminative validity of each one of the constructs.

3.20 Structural Model Evaluation and Hypothesis Testing

This study applied a two-step approach to structural equation modeling analysis, as discussed earlier in this chapter. In the first step, the measurement model was assessed by evaluating CFA latent constructs' unidimensionality, reliability, and validity. The structural model can therefore be evaluated as the next main stage in analyzing the hypothesized interactions in the proposed model between the latent constructs (Kline,

2005; Hair *et al.*, 2016). The structural model (hypothesized model) demonstrates the correlation between latent constructs.

In other words, the structural model (hypothesized model) attempts to determine the constructs that affect the values of other constructs in the model directly/indirectly (Kline, 2005; Hair *et al.*, 2006; Hair *et al.*, 2016). In Chapter Five, the results of structural model research are discussed.

3.21 Summary of the Chapter

The purpose of this chapter was to analyze and choose the appropriate methodology and discuss the statistical methods used in this analysis. This chapter stressed that this research adopted the quantitative (positivist) method. A cross-sectional quantitative approach using a survey instrument was also used to collect the information. The survey method was used because it provides a more detailed means of analyzing sample information and allows the researcher to generalize the results to the population from a sample. A questionnaire was created to gather the data for this research. The segment also covered the pilot study, the data-collection process, and the SEM-AMOS data-processing process.

CHAPTER 4

DATA ANALYSIS

4.1 Introduction

The data analysis was discussed in line with the questions and objectives of the study. The chapter is broken down into subsections. The interpretation of the collected quantitative data was provided in the subsequent parts. The analyses included an analysis of the administration of the questionnaire to achieve the study's research objectives.

4.2 Analysis of Questionnaire Administration

A total of 600 questionnaires were administered. Of these, 297 (49.5%) were successfully retrieved, and 24 questionnaires were unusable due to either partial filling by the respondents or multiple options on some issues. This boosted the total available questionnaire to 273, reflecting 45.5 percent of the initial total questionnaire administered, as shown in Table 4.1

Table 4.1: Distribution of questionnaire administration

Details	Number of questionnaires	Percentage
Total questionnaire administered	600	100
Total questionnaire retrieved	297	49.5
Usable questionnaire	273	45.5

4.3 Preliminary Data Screening and Transformation

Preliminary research was performed to meet the multivariate data analysis criteria before performing the primary CB-SEM analysis. The preliminary research included analysing missing working dataset values, descriptive statistics, and data normality checking, discussed in the following sections.

4.3.1 Missing Values Analysis

According to Tabachnick and Fidell (2013), missing data is a persistent problem in the data processing. The condition of missing data occurs when the working dataset lacks valid values on one or more variables as a result of the intentional or otherwise inability of the respondent to respond to those questions being asked (Hair *et al*., 2010). The pattern of missing data in a given dataset will cause the final result to be seriously problematic. Data that may need specialized treatment to ensure the generalizability of the result obtained from the dataset may be randomly or systematically absent (Tabachnick & Fidell, 2013). In a given dataset, Hair *et al*. (2010) identified three distinct trends of missing values, namely: absolutely missing at random (MCAR), missing at random (MAR), or missing not at random (MNAR).'

The required diagnostic method for identifying and correcting the lack of values in the data set was defined as follows (Hair *et al*., 2010; Tabchnick & Fidell,

2013): The negligible missing values are those already expected from the research collection. The non-ignorable missing values were those that have suddenly occurred, such as the respondent's inability to complete all the questionnaire items due to, for example, question sensitivity (Hair *et al*., 2010). Second: to assess the scope of the missing values. This requires analyzing the pattern of the missing values at variables and case levels. Hair *et al*. (2010) proposed that a missing value below 10% is considered negligible.

Thirdly, assessing the randomness of the missing value's occurrence. The technique involves using Little's MCAR test, a statistical computation of the predicted randomness of the missing value. Suppose the missing values occur randomly when Little's MCAR test yields a result p> 0.05. In that case, the decision rule is to accept the hypothesis and reject the result if, otherwise, the missing values occur (Hair *et al.*, 2010).

Fourth: remedying the missing value issue was the last move. This is accomplished by using an acceptable form of imputation that suits the nature of the missing value pattern. Five methods of imputation can be used in a dataset to solve missing value problems (Tabacknick & Fidell, 2013). However, Hair *et al*. (2010) proposed that the Expectation Maximisation (EM) approach should be used for a randomly missing value pattern.

The missing value analysis was carried out for the current study following the measures listed. As shown in Table 4.3, the outcome showed that the pattern of missing data in the dataset was consistent with the MCAR. BC3 (count=5, 1.8 percent) is the object with the highest missing values, followed by RMP9 with four missing counts (1.5 percent). The observation of the Little MCAR test, as shown in Table 4.2, shows that the Chi-square test is above the threshold (Chi-Square = 441.816, DF = 447, Sig. = .560).

Table 4.2: Missing value analysis of the study items

Items	N	Mean	SD	Missing		No. of Extremes	
				Count	Percent	Low	High
BC1	273	3.6410	.94872	0	.0	4	0
BC2	273	3.7839	.76756	0	.0	1	0
BC3	268	3.8507	.85685	5	1.8	1	0
BC4	273	3.9963	.81574	0	.0	0	0
BC5	273	3.4212	1.08220	0	.0	0	0
BC6	273	3.2088	1.14259	0	.0	0	0
BC7	273	3.1905	1.19450	0	.0	0	0
BC8	273	3.4176	1.12850	0	.0	0	0
BC9	271	3.1919	1.17697	2	.7	0	0
BC10	273	3.1319	1.10022	0	.0	0	0
BC11	273	3.1832	.90919	0	.0	6	0
MC1	273	3.6337	1.10375	0	.0	19	0
MC2	273	3.6337	1.11040	0	.0	22	0
MC3	273	3.9963	.91755	0	.0	22	0
MC4	273	3.5861	1.08842	0	.0	22	0
MC5	273	3.6777	1.08403	0	.0	18	0
MC6	273	4.1319	.85589	0	.0	17	0
MC7	273	4.0842	.78371	0	.0	14	0
MC8	273	4.2527	.72142	0	.0	8	0
MC9	273	4.1282	.79176	0	.0	11	0
MC10	273	3.6484	1.07142	0	.0	16	0
MC11	273	3.6484	1.04361	0	.0	13	0
RMG1	273	3.2125	1.10759	0	.0	0	0
RMG2	273	3.2527	.96931	0	.0	5	0
RMG3	273	3.5568	.87315	0	.0	1	0
RMG4	273	3.5604	.82972	0	.0	2	0
RMG5	273	3.4982	.78649	0	.0	2	0
RMG6	273	3.4396	.81180	0	.0	1	0
RMG7	273	3.3553	.83255	0	.0	3	0
RMG8	273	3.3297	.81874	0	.0	5	0
RMG9	273	3.5934	.78090	0	.0	0	0

Table 3.2: Missing value analysis of the study items (continued)

Items	N	Mean	SD	Missing		No. of Extremes	
				Count	Percent	Low	High
RMG10	272	3.5551	.75670	1	.4	2	0
RMP1	273	4.2967	.93731	0	.0	20	0
RMP2	273	4.0037	1.20201	0	.0	0	0
RMP3	272	3.8272	1.26968	1	.4	0	0
RMP4	273	4.1099	.98276	0	.0	19	0
RMP5	273	4.1392	1.11261	0	.0	28	0
RMP6	273	4.0586	1.09320	0	.0	0	0
RMP7	273	4.1429	1.08368	0	.0	26	0
RMP8	272	3.9779	1.09657	1	.4	0	0
RMP9	269	3.9145	1.20483	4	1.5	0	0
RMP10	272	3.9596	1.10776	1	.4	0	0
RMC1	273	4.0696	.86958	0	.0	17	0
RMC2	273	4.0330	.85900	0	.0	18	0
RMC3	273	3.6703	1.07841	0	.0	20	0
RMC4	272	3.6507	1.07267	1	.4	15	0
RMC5	272	4.0919	.82108	1	.4	15	0
RMC6	272	3.6949	.98639	1	.4	8	0
RMC7	273	3.5641	1.06261	0	.0	15	0
RMC8	273	3.7289	1.01811	0	.0	11	0
RMC9	273	3.6923	.98920	0	.0	12	0

a. Number of cases outside the range (Q1 - 1.5*IQR, Q3 + 1.5*IQR).
b. Little's MCAR test: Chi-Square = 441.816, DF = 447, Sig. = .560

BC = Business Continuity; MC = Management Commitment; RMG= Risk Management Governance; RMP = Risk Management Process; RMC = Risk Management Culture

4.4 Normality Test

One of the multiple multivariate analysis criteria is to ensure that the data complies with the assumption of normality. Tabachnick and Fidell (2013) warned that non-normal data leads to errors in the findings that are prone to incorrect inference by the researcher. Hair *et al.* (2010) recommended that both univariate and multivariate normality must be tested when performing multivariate analysis. The results of both the univariate and multivariate normality tests are recorded in the following sub-sections.

4.4.1 Univariate Normality

The univariate normality test involves analyzing data distribution at an individual item or variable level to determine the degree to which the variable's distribution varies from the normal probability curve (Hair *et al.*, 2014). Using graphs such as histograms, box-plot, and stem-and-leaf, skewness and kurtosis metrics or omnibus statistical tests such as Shapiro-Wilk and z-test approximation, univariate normality was evaluated (Pallant, 2011).

The methods of skewness and kurtosis were used in the current research to verify the normality of the results. The rule of thumb for defining normality using the skewness and kurtosis criterion equates the measured values with a magnitude of ±2 (Pituch & Steven, 2016). Values above this level are considered non-normal, whereas values below 2 are considered non-normal, whereas values below 2 are considered approximate to the normal distribution. As shown in Table 4.3, all six constructs have skewness and kurtosis values lower than ±2 at the individual construct level, meaning that the data is roughly average

Table 4.3: Univariate normality test using skewness and Kurtosis

Items	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
BC	273	3.4549	.79805	−.202	.147	−1.322	.294
MC	273	3.8565	.63595	−1.415	.147	1.401	.294
RMG	273	3.4355	.66941	−.054	.147	−1.097	.294
RMP	273	4.0388	.76699	−.916	.147	.124	.294
RMC	273	3.7973	.69564	−1.286	.147	.830	.294

BC = Business Continuity; MC = Management Commitment; RMG= Risk Management Governance;RMP = Risk Management Process; RMC = Risk Management Culture

4.4.2 Multivariate Normality

Upon defining univariate normality, multivariate normality was tested. Field (2009) stressed that satisfying the concept of multivariate normality is a sufficient condition to be fulfilled in any multivariate analysis. In light of this point, multivariate normality was tested using the Mahalanobis Distance test. The distance from Mahalanobis is from a given case's centroid from the remaining cases (Pallant, 2011). Multiple regression analysis is performed to obtain the Mahal gap, including one of the independent variables to represent the dependent variable in the regression. In contrast, the remaining independent variables were used as independent variables. In each case, based on the degree of freedom and the significance level of .001, the Mahal distance obtained from the analysis is compared to the critical value obtained from the Chi-square table (2011, Pallant). The decision is made if the Mahal distance value is greater than the critical value, then the particular case is a multivariate outlier that can distort the data normality. If none, however, of the Mahal, distance is greater than the critical value, meaning that it is not a concern for multivariate outliers, thereby implying multivariate normality.

The Mahal was introduced in Table 4.4. Value for distance. The minimum value is .152, as seen in the table, while the limit is 20.994. 15.358 and 14.660 were the next highest values. The corresponding critical value for df=4 and p<.001 from the chi-square table showed a value of 18.467. It reveals that only one event was an outlier. Thus, subsequent studies deleted the affected case from the data file.

Table 4.4: Multivariate test of outliers

Description	Minimum	Maximum	Mean	SD		N
Predicted Value	2.7843	4.4175	3.6410	.39568		273
Std. Predicted Value	−2.165	1.962	.000	1.000		273
Standard Error of Predicted Value		.056	.247	.113	.034	273
Adjusted Predicted Value		2.7779	4.4254	3.6413	.39850	273
Residual		−3.24352	2.11142	.00000	.86227	273
Std. Residual		−3.734	2.431	.000	.993	273
Stud. Residual		−3.824	2.458	.000	1.003	273
Deleted Residual		−3.40131	2.16008	−.00031	.88035	273
Stud. Deleted Residual		−3.925	2.482	−.001	1.009	273
Mahal. Distance		.152	20.994	3.985	3.236	273
Cook's Distance		.000	.142	.004	.013	273
Centered Leverage Value		.001	.077	.015	.012	273

4.5 Confirmatory factor analysis (CFA)

To empirically evaluate the proposed relationships identified in the research model, a CFA needs to be carried out after evaluating the structure and reliability of the construct through exploratory factor analysis (EFA) at a pilot survey stage. The CFA is considered a reliable tool for checking the validity of a theory (Hair *et al*., 2010). In this chapter, using covariance-based structural equation modeling (CB-SEM) technology, the validity of the research framework was checked. The study followed the CB-SEM technique recommended in a multivariate number of studies (Hair *et al*., 2010; Byrne, 2010; Kline, 2011).

The research started with model specification; model identification; parameter estimation; goodness-of-fit evaluation, and, finally, model re-specification. This method was followed repeatedly in evaluating the measurement and structural analysis models before a valid model was obtained. The validity of the models was assessed based on the CB-SEM evaluation criteria provided in Table 4.5. Hair *et al.* (2010), Kline (2011), and Byrne (2010) proposed that a model, i.e., absolute fit, incremental fit, and parsimonious fit indices, should fulfil the requirement of at least one index from each of the indexed categories. In relation to the RMSEA, Byrne (2010) noted that in determining model fit, a range of 0.08 to 1.00 is also appropriate

Table 4.5: CFA using Goodness-of-fit Indices analysis

Index Category	**Indices Used**	**Acceptable level**	**Supporting source**
Absolute fit	Chisq.	P < 0.05	Kline (2011); Byrne (2010); Wheaton *et al.* (1977)
Absolute fit	RMSEA	Value < 0.08	Kline (2011); Byrne (2010); Brownne & Cudeck (1993)
Absolute fit	GFI	Value > 0.90	Jorekog & Sorbom (1984)
Incremental fit	AGFI	Value > 0.90	Tanka & Huba (1985)
Incremental fit	CFI	Value > 0.90	Bentler (1990)
Parsimonious fit	Chisq./df	Value ≤5.0	Marsh & Hoeevar (1985)

The analysis was performed using AMOS graphic software, where the Maximum Likelihood (ML) estimation approach was used to evaluate the respective constructs' measurement models and the overall measurement and structural models following the specified goodness-of-fit indices shown in Table 4.5. Until good fits were produced, models were repeatedly re-specified. The analyses of the measurement model of the related constructs are defined in the following sections.

4.5.1 Measurement model assessment for Business Continuity (BC) construct

The BC construct consists of eleven (11) measurement objects measuring respondents' views on the build. All eleven items were included in the present review after passing the reliability test in the pilot survey process. The validity of the BC measurement model was tested by analyzing the factor loadings, the squared multiple regression (R^2) and the fitness indices using the AMOS graphic. The literature indicates a loading factor and R^2 of not less than 0.50 and 0.30, respectively, to determine the validity of the measurement model (Kline, 2011; Byrne, 2010). Hair *et al*. (2011) proposed that the measurement model should exclude any factor with a value lower than the recommended minimum. As shown in Figure 4.1, the following BC measurement model was evaluated per the guidelines in AMOS graphics.

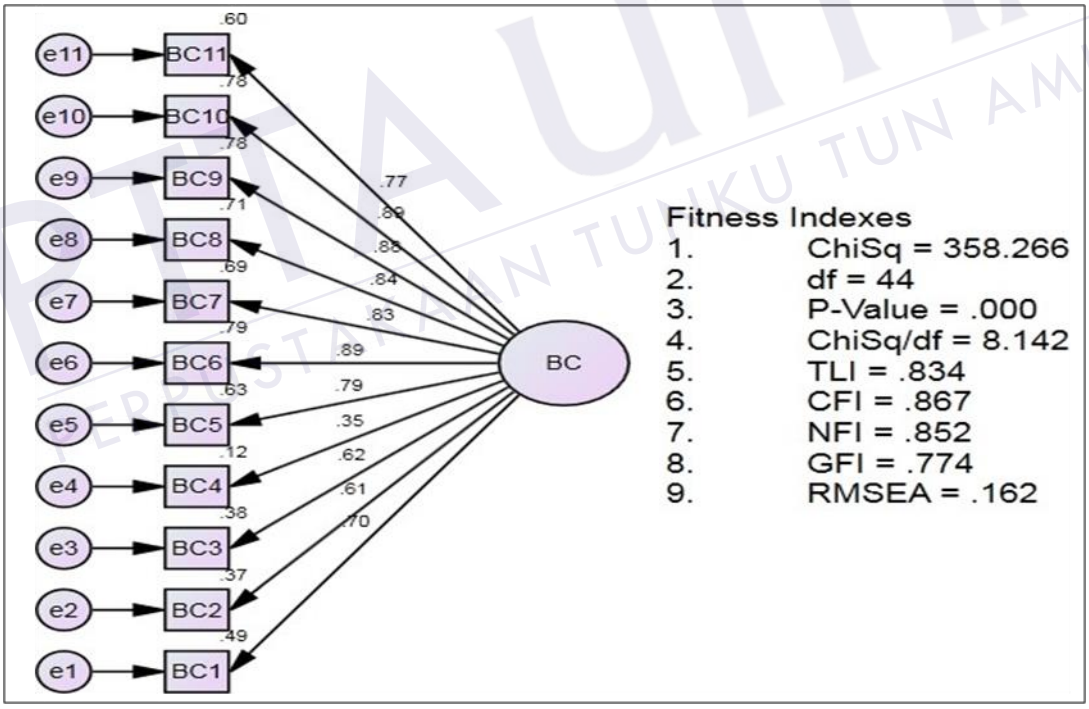

Figure 4.1: Measurement model for Business Continuity (BC)

As shown in Figure 4.1, the factor loadings for 10 of the eleven indicators that measured the BC construct yielded values within the recommended thresholds. In contrast, only BC4 showed a value less than .50, suggesting the need for deletion. Similarly, the examination of the goodness-of-fit indices also revealed that the measurement model for the BC construct is invalid, as some of the fit statistics reported

values outside the acceptable thresholds. This implies that the measurement model needs to be re-specified.

Table 4.6 presents the factor loadings, p-statistics, and the model fit statistics for the BC construct. As indicated in the Table, all the factor loadings were above 0.50 except that of BC4, which returned .351. Similarly, the examination of the squared multiple correlations of the individual indicators revealed that they all met the recommended minimum threshold except for BC4, which yielded a value less than .30. The model fit statistics were reported to establish the model fit further. As indicated in Table 4.6, some of the goodness-of-fit measures failed to meet the requirement for establishing model fit, which called for re-specification. The decision to reject the model was then upheld, and the model was re-specified.

Table 4.6: Factor loading of the initial Measurement model for the Business Continuity (BC) construct

Indicators	**Directions**	**Construct**	**Estimate**	**S.E.**	**C.R.**	**P**	**SMC**	**Remark**
BC1	←	Buss_Cont	.702			***	.492	Recommended level achieved
BC2	←	Buss_Cont	.606	.072	9.698	***	.367	Recommended level achieved
BC3	←	Buss_Cont	.617	.082	9.862	***	.380	Recommended level achieved
BC4	←	Buss_Cont	.351	.076	5.640	***	**.123**	Recommended level not achieved
BC5	←	Buss_Cont	.791	.102	12.592	***	.626	Recommended level achieved
BC6	←	Buss_Cont	.891	.108	14.122	***	.793	Recommended level achieved
BC7	←	Buss_Cont	.828	.113	13.163	***	.686	Recommended level achieved
BC8	←	Buss_Cont	.843	.107	13.395	***	.711	Recommended level achieved
BC9	←	Buss_Cont	.884	.111	14.027	***	.782	Recommended level achieved
BC10	←	Buss_Cont	.886	.104	14.049	***	.785	Recommended level achieved
BC11	←	Buss_Cont	.774	.086	12.334	***	.600	Recommended level achieved

Goodness-of-fit measures								
Model identification						Model fit statistics		
Observed variables	=	11	X^2	=	358.266	CFI	=	.867
Estimated parameter	=	22	X^2/df	=	8.142	RMSEA	=	.162
Degree of freedom	=	44	P-value	=	.000	NFI	=	.852
Decision	Model Not accepted							

The initial model was re-specified, as Hair et al. (2010) suggested, after deleting the low-loaded indicator and analyzing the modification index (MI). Figure 4.2 presents the re-specified model with the corresponding loading factor and fit statistics in Table 4.8.

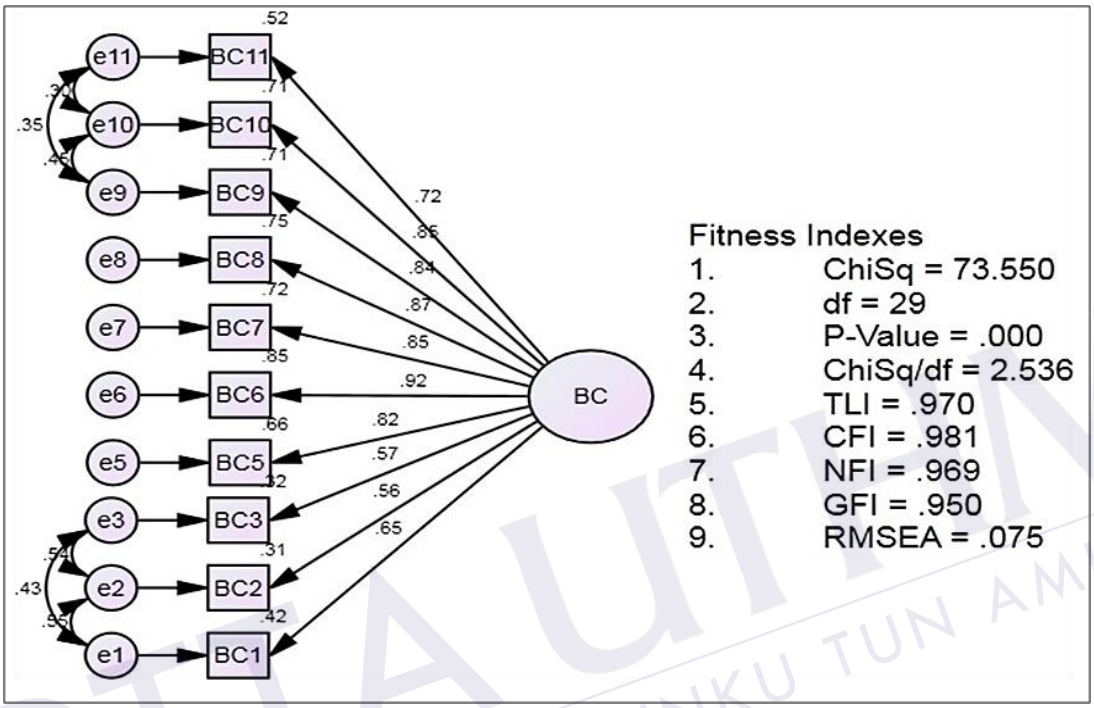

Figure 4.2: Final measurement model Business Continuity

The final measurement model for the BC build is provided in Table 4.7. All requirements for model fit were achieved, as shown in the table. This indicates that the structural model included ten (10) indicators in the build.

Table 4.7: Factor loading of the final measurement model of the Business Continuity (BC) construct

Factor Loading								
Indicators	**Directions**	**Construct**	**Estimate**	**S.E**	**C.R.**	**P**	**SM C**	**Remark**
BC1	←	Buss_Cont	.646	0.072	10.622	***	.417	Recommended level achieved
BC2	←	Buss_Cont	.560	.056	12.454	***	.314	Recommended level achieved
BC3	←	Buss_Cont	.567	.072	11.228	***	.321	Recommended level achieved
BC5	←	Buss_Cont	.815	.124	11.575	**	.665	Recommended level achieved
BC6	←	Buss_Cont	.920	.135	12.671	***	.847	Recommended level achieved
BC7	←	Buss_Cont	.846	.139	11.908	***	.715	Recommended level achieved
BC8	←	Buss_Cont	.867	.132	12.136	***	.752	Recommended level achieved
BC9	←	Buss_Cont	.842	.136	11.854	***	.708	Recommended level achieved
BC10	←	Buss_Cont	.845	.128	11.894	***	.715	Recommended level achieved
BC11	←	Buss_Cont	.721	.102	10.460	***	.520	Recommended level achieved

Goodness-of-fit measures								
Model identification						Model fit statistics		
Observed variables	=	10	X^2	=	73.550	CFI	=	.981
Estimated parameter	=	26	X^2/df	=	2.536	RMSEA	=	.075
Degree of freedom	=	29	P-value	=	.000	NFI	=	.969
Decision	Model accepted							

4.5.2 Initial measurement model for Management Commitment (MC)

The initial measurement model for MC contained eleven (11) indicators pictorially depicted in Figure 4.3. The factor loading and SMC for MC10 and MC11 are below the recommended value of .50 and .30, respectively. In addition, the SMC of MC1 is also below .30. Similarly, the goodness-of-fit statistics reported values less than and/or below the recommended thresholds. In this regard, the model needs to be re-specified by examining the MI, deleting the lower-loaded indicators, or combining the two.

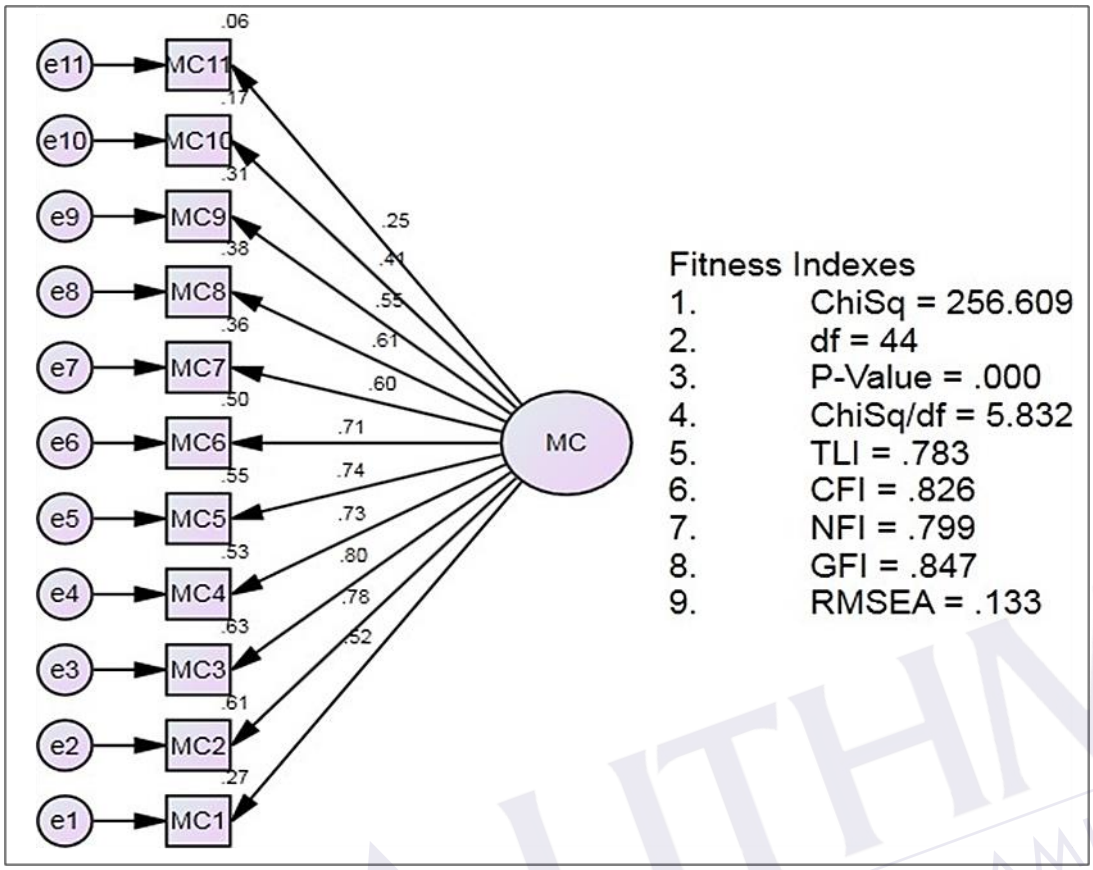

Figure 4.3: Initial measurement model for Management Commitment (MC)

To further assess the fitness of the initial measurement model for the MC, the factor loading and the goodness-of-fit measures are presented in Table 4.8. As mentioned earlier, MC10 and MC11 failed to meet the requirement for retention, which suggested the model re-specification. Also, the RMSEA value of .133 is far above the recommended .08 value, while the CFI of .826 and NFI of .799 were far below the recommended value of >.90. This suggests that the model needs to be re-specified as recommended in the literature (Hair *et al.*, 2010; Kline, 2011).

Table 4.8: Factor loading of the initial measurement model of the Management Commitment (MC) construct

Factor Loading								
Indicators		**Construct**	**Estimate**	**S.E.**	**C.R.**	**P**	**SM C**	**Remark**
MC1	←	MC	.519			***	**.270**	Recommended level not achieved
MC2	←	MC	.778	.178	8.459	***	.606	Recommended level achieved
MC3	←	MC	.796	.149	8.546	***	.633	Recommended level achieved
MC4	←	MC	.727	.169	8.178	***	.528	Recommended level achieved
MC 5	←	MC	.743	.170	8.272	***	.553	Recommended level achieved
MC6	←	MC	.710	.131	8.078	***	.504	Recommended level achieved
MC7	←	MC	.604	.112	7.368	***	.364	Recommended level achieved
MC8	←	MC	.613	.104	7.436	***	.376	Recommended level achieved
MC9	←	MC	.553	.110	6.972	***	.306	Recommended level achieved
MC10	←	MC	.410	.136	5.638	***	.168	Recommended level not achieved
MC11	←	MC	.254	.123	3.758	***	.064	Recommended level not achieved

Goodness-of-fit measures								
Model identification						Model fit statistics		
Observed variables	=	11	X^2	=	256.609	CFI	=	.826
Estimated parameter	=	22	X^2/df	=	5.832	RMSEA	=	.133
Degree of freedom	=	44	P-value	=	.000	NFI	=	.799
Decision	Model unaccepted							

After the deletion of the problematic indicators, the model was re-specified, and the analysis was re-run. The output of the re-specified model is presented in Figure 4.4, with the corresponding factor loading and fit statistics in Table 4.9.

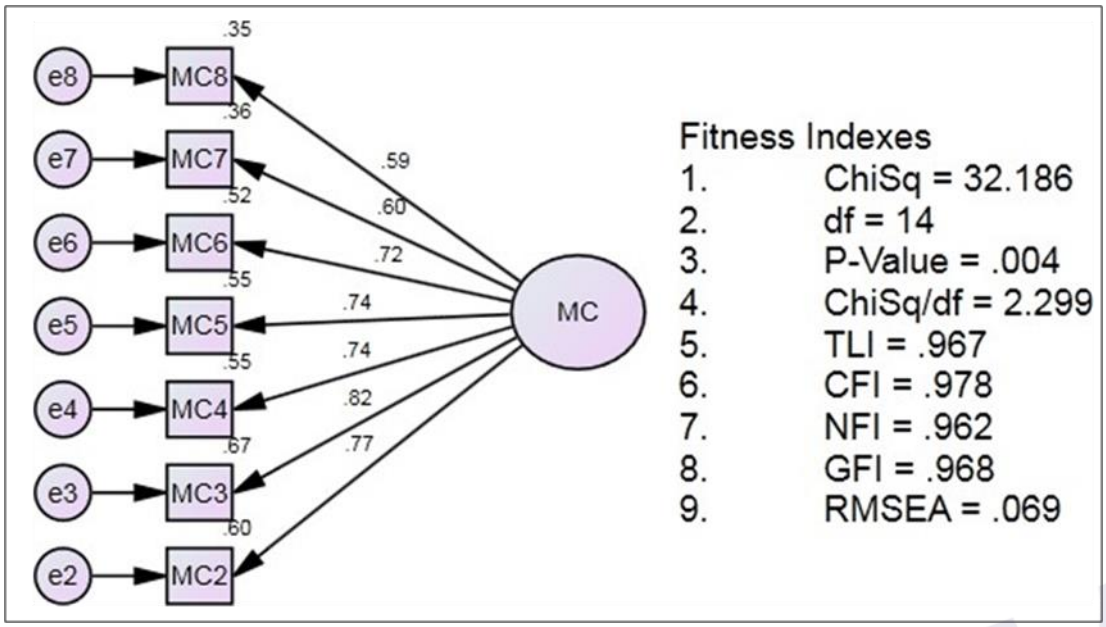

Figure 4.4: Final measurement model for Management Commitment (MC)

In Table 4.9, the final measurement model for MC is presented. As shown in the table, all criteria for model fit were achieved after deletion and modification after deletion and modification after deletion and modification. This means that all the retained seven (7) indicators of the construct were included in the overall measurement model.

Table 4.9: Factor loading for the final measurement model for Management Commitment (MC) construct

Factor Loading								
Indicators	**Directions**	**Construct**	**Estimate**	**S.E.**	**C.R.**	**P**	**SM.C**	**Remark**
MC2	←	MC	.772			***	.597	Recommended level achieved
MC3	←	MC	.818	.063	13.831	***	.669	Recommended level achieved
MC4	←	MC	.741	.076	12.386	***	.549	Recommended level achieved
MC5	←	MC	.741	.076	12.392	***	.549	Recommended level achieved
MC6	←	MC	.724	.060	12.075	***	.525	Recommended level achieved
MC7	←	MC	.596	.056	9.723	***	.355	Recommended level achieved
MC8	←	MC	.591	.052	9.639	***	.350	Recommended level achieved

Goodness-of-fit measures								
Model identification						Model fit statistics		
Observed variables	=	7	X^2	=	32.186	CFI	=	.978
Estimated parameter	=	14	X^2/df	=	2.299	RMSEA	=	.069
Degree of freedom	=	14	P-value	=	.004	NFI	=	.962
Decision	Model accepted							

4.5.3 Initial measurement model for Risk Management Culture (RMC)

Figure 4.5 shows the graphical presentation of the initial measurement model for the RMC construct. As shown in the figure, RMC6 and RMC7 have factor loading and SMC values lower than the required minimum of .50 and .30, respectively, indicating that model re-specification was required.

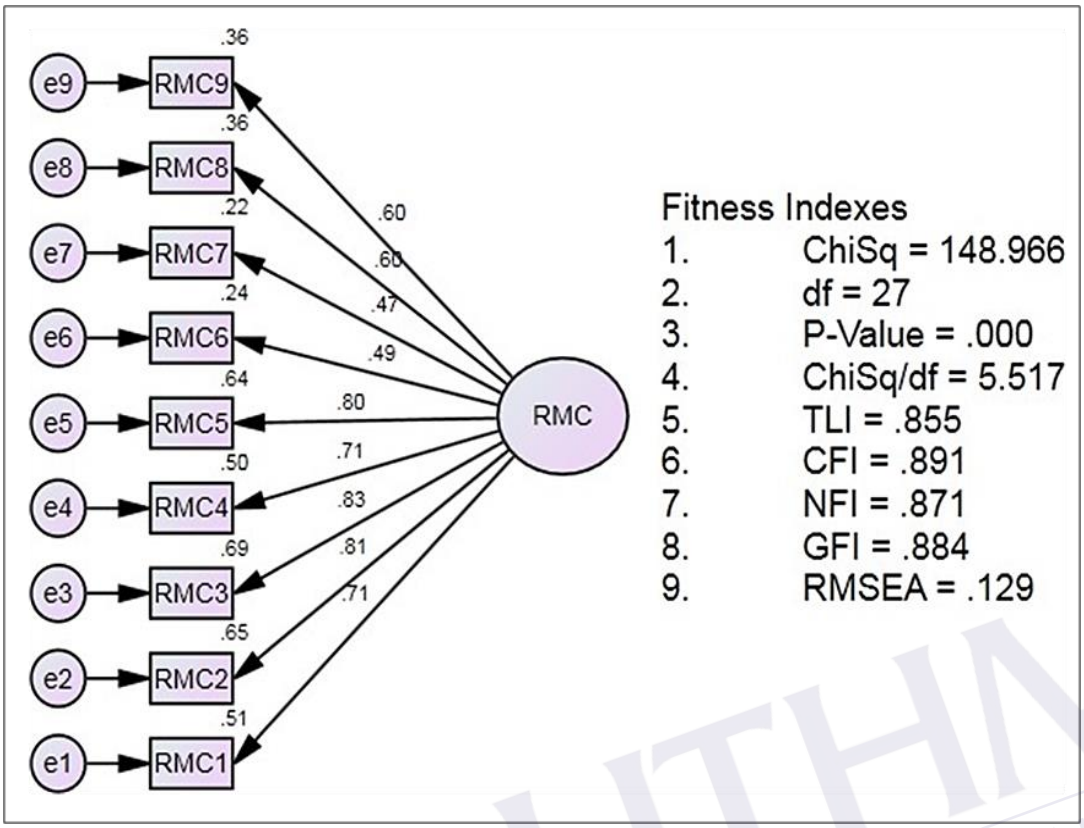

Figure 4.5: Initial measurement model for Risk Management Culture (RMC)

Table 4.10 presents the factor loading and model fit statistics. Based on factor loading and SMC criteria, only seven (7) items meet the acceptance level. Two indicators failed to meet the acceptance criterion, which suggests model re-specification. The respective indicators are RMC6 and RMC7, with factor loadings and SMC values of .49, .24 and .47, .22, respectively. Moreover, RMSEA, CFI, and NFI reported poor fit statistics, suggesting the need for model re-specification.

Table 4.10: Factor loading for the initial measurement model of the Risk Management Culture (RMC) construct

Factor Loading								
Indicators		**Construct**	**Estimate**	**S.E**	**C.R.**	**P**	**SM C**	**Remark**
RMC1	←	RMC	.711			***	.505	Recommended level achieved
RMC2	←	RMC	.808	.090	12.538	***	.653	Recommended level achieved
RMC3	←	RMC	.832	.113	12.879	***	.692	Recommended level achieved
RMC4	←	RMC	.705	.112	10.992	***	.498	Recommended level achieved
RMC 5	←	RMC	.798	.085	12.387	***	.637	Recommended level achieved
RMC6	←	RMC	.491	.102	7.678	***	**.241**	Recommended level not achieved
RMC7	←	RMC	.467	.110	7.309	***	**.218**	Recommended level not achieved
RMC8	←	RMC	.601	.105	9.381	***	.361	Recommended level achieved
RMC9	←	RMC	.603	.102	9.418	***	.364	Recommended level achieved

Goodness-of-fit measures								
Model identification						Model fit statistics		
Observed variables	=	9	X^2	=	148.966	CFI	=	.891
Estimated parameter	=	18	X^2/df	=	5.517	RMSEA	=	.129
Degree of freedom	=	27	P-value	=	.000	NFI	=	.871
Decision	Model unaccepted							

The model was re-specified by deleting the RMC6 and RMC7, and the final model was formulated, as shown in Figure 4.6. The final model indicated that all the criteria for model fit were achieved. The factor loading of the retained indicators and the model. Fit statistics are presented in Table 4.10.

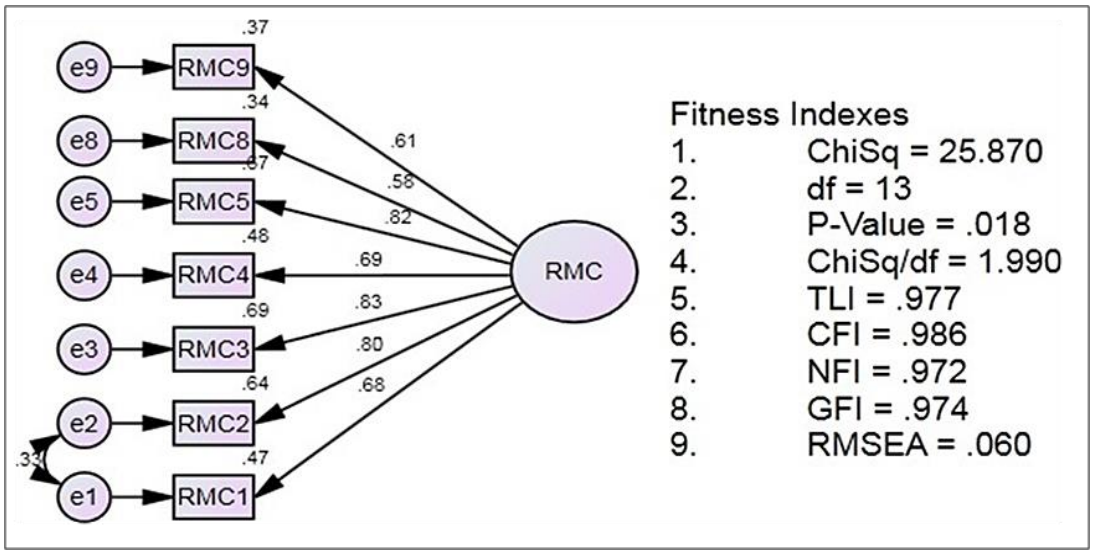

Figure 4.6: Final measurement model for Risk Management Culture (RMC)

As shown in Table 4.11, the factor loadings for the retained items were above the .50 threshold. Similarly, all the model fit statistics indicated that the measurement model is valid, suggesting that the seven (7) indicators can conveniently be used in the overall structural model assessment model.

Table 4.11: Factor loading for the final measurement model of Risk Management Culture (RMC)

Factor Loading								
Indicators		**Construct**	**Estimate**	**S.E.**	**C.R.**	**P**	**SM C**	**Remark**
RMC1	←	RMC	.683			***	.467	Recommended level achieved
RMC2	←	RMC	.797	.082	14.107	***	.636	Recommended level achieved
RMC3	←	RMC	.828	.127	11.851	***	.686	Recommended level achieved
RMC4	←	RMC	.692	.124	10.195	***	.479	Recommended level achieved
RMC 5	←	RMC	.821	.096	11.777	***	.675	Recommended level achieved
RMC8	←	RMC	.584	.114	8.741	***	.341	Recommended level achieved
RMC9	←	RMC	.608	.112	9.072	***	.370	Recommended level achieved

Goodness-of-fit measures								
Model identification						Model fit statistics		
Observed variables	=	9	X^2	=	25.870	CFI	=	.986
Estimated parameter	=	15	X^2/df	=	1.990	RMSEA	=	.060
Degree of Freedom	=	13	P-value	=	.018	NFI	=	.972
Decision	Model unaccepted							

4.5.4 Initial measurement model of Risk Management Governance (RMG)

Figure 4.7 and Table 4.13, respectively, show the graphical display and the result of the CFA of the initial RMG measurement model. The figure shows the relationship between the objects or measures of the calculation and the underlying construct.

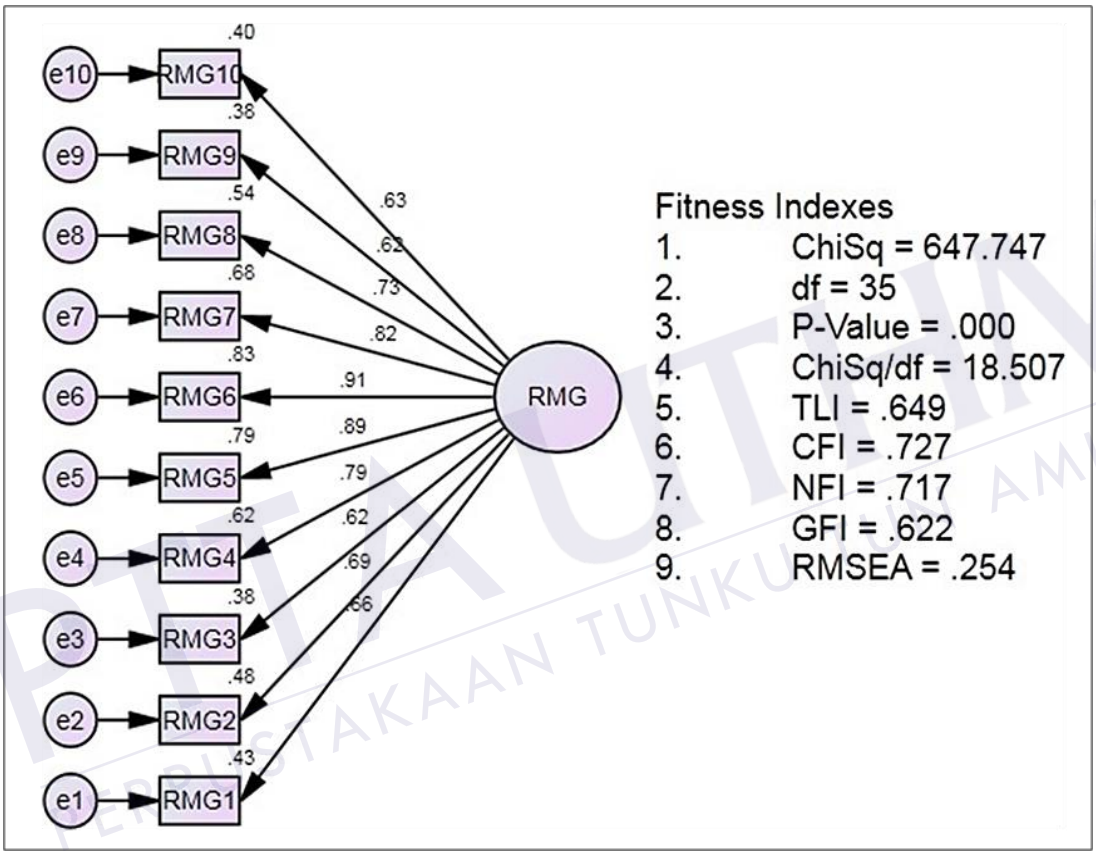

Figure 4.7: Factor loading of the measurement model for Risk Management Governance (RMG) construct

As shown in Table 4.12, for the ten (10) measurement items for the RMG, all the factor loads and the corresponding R2 values were recorded within the acceptance stage. On the other hand, the study revealed some of the fit statistics models. For example, CFI and NFI reported values lower than the .90 recommended threshold, RMSEA reported values much higher than the .08 recommended value, and X2/df is higher than 5. Therefore, model re-specification was required to achieve a good-fit model.

Table 4.12: Factor loading of the initial measurement model for (RMG) construct

Factor Loading								
Indicators		**Construct**	**Estimate**	**S.E.**	**C.R.**	**P**	**SM C**	**Remark**
RMG1	←	RMG	.658			***	.433	Recommended level achieved
RMG2	←	RMG	.694	.089	10.352	***	.481	Recommended level achieved
RMG3	←	RMG	.618	.079	9.361	***	.382	Recommended level achieved
RMG4	←	RMG	.789	.078	11.547	***	.622	Recommended level achieved
RMG5	←	RMG	.891	.075	12.739	***	.794	Recommended level achieved
RMG6	←	RMG	.914	.078	12.986	***	.835	Recommended level achieved
RMG7	←	RMG	.825	.079	11.979	***	.680	Recommended level achieved
RMG8	←	RMG	.732	.076	10.848	***	.536	Recommended level achieved
RMG9	←	RMG	.616	.071	9.324	***	.379	Recommended level achieved
RMG10	←	RMG	.634	.069	9.564	***	.401	Recommended level achieved

Goodness-of-fit measures								
Model identification						Model fit statistics		
Observed variables	=	10	X^2	=	647.747	CFI	=	.727
Estimated parameter	=	20	X^2/df	=	18.507	RMSEA	=	.254
Degree of freedom	=	35	P-value	=	.000	NFI	=	.717
Decision	Model unaccepted							

Figure 4.8 presents the re-specified measurement model for RMG, which served as the final measurement model for the construct. The graphical display and Table 4.13 show that the entire model fit statistics and validity requirements were achieved after freeing up some parameters. Upon examining the MI, the model was re-specified, and the model fit was achieved.

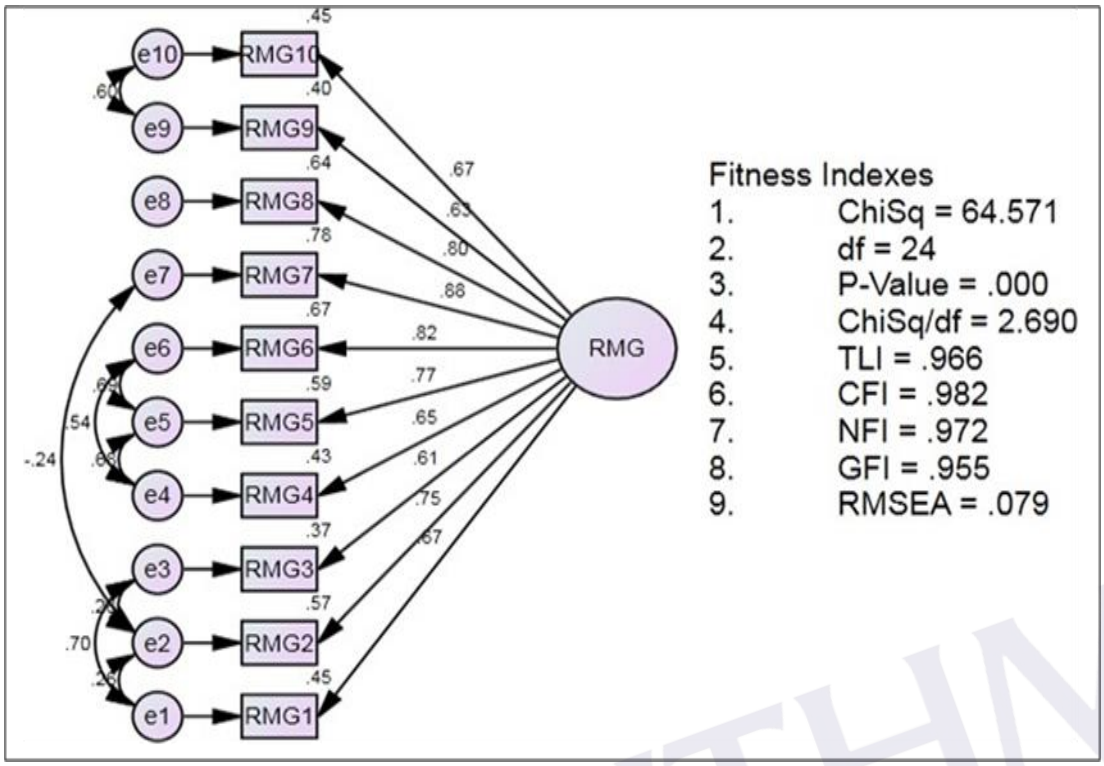

Figure 4.8: Factor loading of the final measurement model for Risk Management Governance (RMG).

As shown in Table 4.13, the suggested requirements for model acceptance were fulfilled by the factor loadings and the R^2 values for the ten (10) elements of the final measurement model for RMG. Additionally, the model goodness-of-fit indices recorded values within the appropriate range of the respective model fit measures. Specifically, an example of a good-fit model is RMSEA=.079, CFI=.982, NFI=.972, X2/df=2.690 and p<.05.

Table 4.13: Factor loading for the final model for Risk Management Governance (RMG) construct

Factor Loading								
Indicators		**Construct**	**Estimate**	**S.E.**	**C.R.**	**P**	**SM C**	**Remark**
RMG1	←	RMG	.671			***	.451	Recommended level achieved
RMG2	←	RMG	.752	.080	12.130	***	.565	Recommended level achieved
RMG3	←	RMG	.606	044	16.250	***	.368	Recommended level achieved
RMG4	←	RMG	.653	.078	9.279	***	.426	Recommended level achieved
RMG5	←	RMG	.768	.073	11.186	***	.591	Recommended level achieved
RMG6	←	RMG	.818	.076	11.789	***	.669	Recommended level achieved
RMG7	←	RMG	.883	.080	12.423	***	.780	Recommended level achieved
RMG8		RMG	.800	.076	11.545	***	.640	Recommended level achieved
RMG9		RMG	.633	.07	9.487	***	.401	Recommended level acieved
RMG10		RMG	.669	.068	9.955	***	.447	Recommended level achieved

Goodness-of-fit measures								
Model identification						Model fit statistics		
Observed variables	=	10	X^2	=	64.571	CFI	=	.982
Estimated parameter	=	31	X^2/df	=	2.690	RMSEA	=	.079
Degree of freedom	=	24	P-value	=	.000	NFI	=	.972
Decision	Model accepted							

4.5.5 Initial measurement model for Risk Management Process (RMP) construct

The relationship between RMP and its related indicators is shown in Figure 4.9. The model's fitness and validity were checked by running the initial CFA without enforcing any co-variation on the parameters. The initial model failed to meet the suggested fitness requirements, as seen in the study, hence the need for re-specification. The three RMP8, RMP9, and RMP10 indicators registered SMC and R2 values lower than the minimum levels required. Similarly, the analysis of the goodness-of-fit tests showed that the model was inappropriate. Values below the recommended threshold of .90 were reported by both CFI and NFI, while X2/df and RMSEA reported values more

significant than the required acceptability levels. To solve the problem, the model was then re-specified.

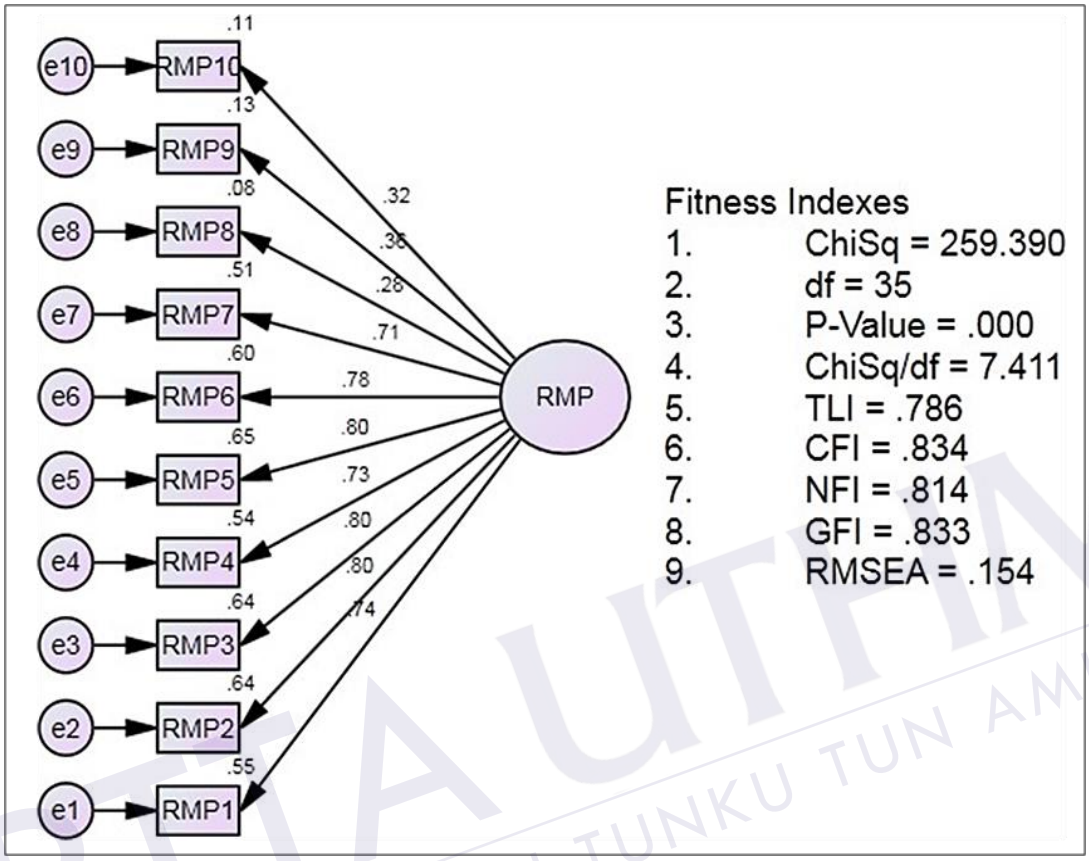

Figure 4.9: Factor loading of the initial measurement model for (the RMP) construct

From Table 4.14, the factor loadings and the SMCs of RMP8, RMP9, and RMP10 failed to meet the required thresholds for model acceptance. In addition, some model fitness indicators were outside the acceptance threshold, suggesting the need for model re-specification to ensure the attainment of goodness-of-fit and model acceptance.

Table 4.14: Factor loading of the Initial measurement model for Risk Management Process (RMP) construct

Factor Loading								
Indicators	**Directions**	**Construct**	**Estimate**	**S.E.**	**C.R.**	**P-value**	**SMC**	**Remark**
RMP1	←	RMP	.744			***	.554	Recommended level achieved
RMP2	←	RMP	.802	.104	13.301	***	.643	Recommended level achieved
RMP3	←	RMP	.797	.110	13.226	***	.636	Recommended level achieved
RMP4	←	RMP	.735	.086	12.099	***	.540	Recommended level achieved
RMP5	←	RMP	.804	.096	13.350	***	.647	Recommended level achieved
RMP6	←	RMP	.778	.095	12.872	***	.605	Recommended level achieved
RMP7	←	RMP	.711	.095	11.687	***	.506	Recommended level achieved
RMP8		RMP	.283	.100	4.491	***	.080	Recommended level not achieved
RMP9		RMP	.356	.111	5.674	***	.127	Recommended level not achieved
RMP10		RMP	.324	.100	5.157	***	.105	Recommended level not achieved

Goodness-of-fit measures								
Model identification						Model fit statistics		
Observed variables	=	10	X^2	=	259.390	CFI	=	.834
Estimated parameter	=	20	X^2/df	=	7.411	RMSEA	=	.154
Degree of freedom	=	35	P-value	=	.000	NFI	=	.814
Decision	Model Not accepted							

Figure 4.10 presents the graphical display of the re-specified measurement model. Upon examining the modification index of the initial measurement model, a final measurement model was created by deleting the three problematic items. This led to the attainment of desirable results for the model of fit.

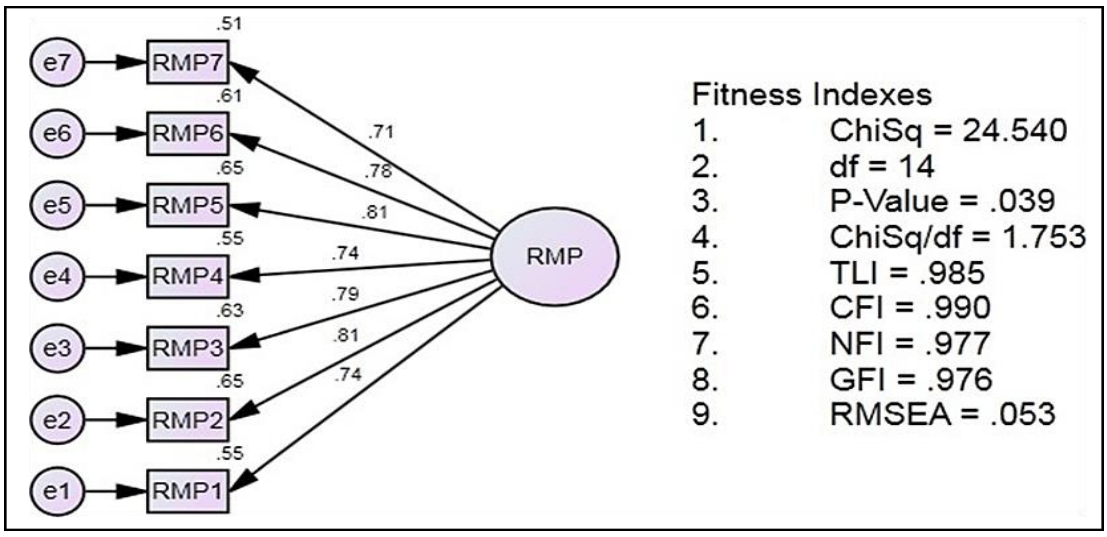

Figure 4.10: Factor loading of the initial measurement model for (the RMP) construct

Table 4.15 presents the final measurement model for the RMP. Seven of the ten indicators were retained to be used in further analyses. The measures of construct validity and model fit statistics meet the recommended thresholds for model acceptance. The entire factor loadings and the SMCs for the seven indicators meet acceptable limits. In addition, all model fitness indexes reported values within acceptable levels. RMSEA reported a value of .053, CFI = .990, NFI = .977, $X2$/df = 1.753 and p=.039.

Table 4.15: Factor loading of the final measurement model for the Risk Management Process (RMP) construct

Factor Loading								
Indicators		**Construct**	**Estimates**	**S.E**	**C.R.**	**P**	**SMC**	**Remark**
RMP1	←	RMP	.741			***	.549	Recommended level achieved
RMP2	←	RMP	.805	.105	13.267	***	.648	Recommended level achieved
RMP3	←	RMP	.794	.111	13.079	***	.631	Recommended level achieved
RMP4	←	RMP	.741	.086	12.131	***	.549	Recommended level achieved
RMP5	←	RMP	.806	.097	13.276	***	.649	Recommended level achieved
RMP6	←	RMP	.782	.096	12.856	***	.611	Recommended level achieved
RMP7	←	RMP	.714	.095	11.667	***	.510	Recommended level achieved

Goodness-of-fit measures								
Model identification						Model fit statistics		
Observed variables	=	10	X^2	=	24.540	CFI	=	.990
Estimated parameter	=	14	X^2/df	=	1.753	RMSEA	=	.053
Degree of freedom	=	14	P-value	=	.039	NFI	=	.977
Decision	Model accepted							

BC = Business Continuity; MC = Management Commitment; RMG= Risk Management Governance; RMP = Risk Management Process; RMC = Risk Management Culture

4.6 Assessment of the overall measurement model validity

Having defined the validity and model fit of the individual constructs, the validity of the entire measurement model of the research must be assessed before evaluating the structural model. The reason for carrying out this study was to determine the validity in the unison of the entire constructs. The validity of the entire measurement model

was evaluated by analyzing the convergent validity and discriminant validity of the constructs in the model.

4.6.1 Convergent validity

Convergent validity measures the degree to which a construct's measuring objects or measures are associated with the construct. According to Hair et al. (2010), Statistically significant factor loadings indicate the achievement of convergent validity. In contrast, the factor loading value indicator of .50 and above is considered adequate to define convergent validity. The Bentler-Bonett coefficient evaluates convergent construct validity in CFA SEM analysis (NFI). The suggested convergent validity threshold using the NFI index is .90 (Hair *et al.*, 2010; Kline, 2011; Byrne, 2010).

The convergent validity of the individual final measurement models showed, using the factor loading and the NFI parameters, that they all satisfy the appropriate threshold. The description of statistics derived from the final models presented for each build is presented in Table 4.16. (Figure 4.1 to Figure 4.10).

Table 4.16: Convergent validity measures of final measurement models of all the constructs

S/N	Construct	Residual items number	Factor loading		NFI Index
			Lowest FL	Highest FL	
1	Business Continuity	10	.560	.920	.969
2	Management Commitment	7	.591	.818	.962
3	Risk Management Governance	10	.606	.883	.972
4	Risk Management Process	7	.714	.806	.977
5	Risk Management Culture	7	.584	.828	.972

4.6.2 Discriminant validity

The degree to which a construct is distinct from other constructs in the model is calculated by discriminant validity. Concerning other constructs, Hair *et al.* (2014), and Yeap et al. (2016) indicated that discriminant validity tests the degree of uniqueness of a construct. If the square inter-construction correlation linked to a given construction is greater than the corresponding inter-construction correlation estimates with other constructs, discriminant validity is achieved (Hair *et al.*, 2010). The rule of judgment for establishing discriminant validity is to ensure that the number of square correlations of a given construct's Average Variance Extracted (AVE) indicators is greater than the correlation of the construct with any other construct in the model. For AVE, the suggested threshold is .50 and above (Hair *et al*., 2014). Table 4.17 shows at the diagonal the AVE of each construct, while the off-diagonal values represent the coefficients of correlation between the constructs. Based on the proposed threshold, all the AVEs are greater than .50, and each AVE meaning is greater than any correlation with the other constructs, thus suggesting the achievement of discriminant validity.

Table 4.17: Discriminant validity of the research constructs

	BC	MC	RMG	RMP	RMC
BC	**.802**				
MC	.047	**.871**			
RMG	.611	−.022	**.783**		
RMP	.250	−.034	.176	**.765**	
RMC	.078	.864	-.008	−.033	**.873**

BC = Business Continuity; MC = Management Commitment; RMG= Risk Management Governance; RMP = Risk Management Process; RMC = Risk Management Culture

4.6.3 Multicollinearity assessment

Multicollinearity assessment is another important evaluation that needs to be done before determining the structural model of the study. Multicollinearity is the existence of a powerful association between predictor variables, according to Pallant (2011). Because of its ability to cause an error in hypothesis testing, multicollinearity in a dataset is considered a challenge to the validity of multiple regression analysis (Hair *et al.*, 2010, Tabachnick & Fidell, 2013). The association between any two constructs is recommended not to exceed .90 (Hair *et al.*, 2010).

The correlation matrix of the constructs is provided in Table 4.18 and Figure 4.11 to determine the existence of multicollinearity in the research model. As shown in the table, the coefficients of Pearson's correlation between the constructs were all within reasonable limits. The highest correlation between MC and RMG is .864, while the smallest correlation between RMG and RMC is -.008. This means that there is no unnecessary multicollinearity between constructs that could affect the outcome's validity. Therefore, the structural model assessment contained all the constructs.

Table 4.18: Correlation matrix of research constructs

	BC	**MC**	**RMG**	**RMP**	**RMC**
BC					
MC	.047				
RMG	.611	−.022			
RMP	.250	−.034	.176		
RMC	.078	.864	-.008	-.033	

BC = Business Continuity; MC = Management Commitment; RMG= Risk Management Governance; RMP = Risk Management Process; RMC = Risk Management Culture

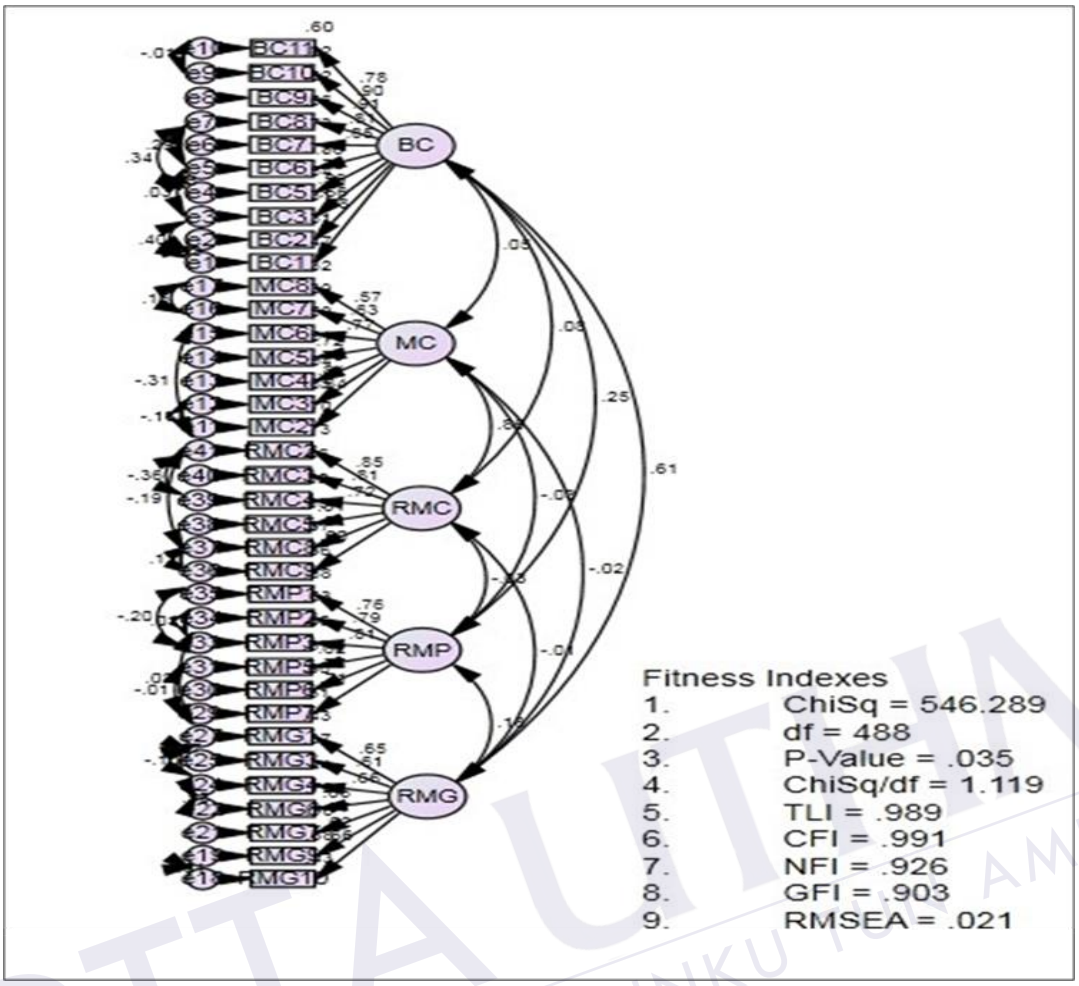

Figure 4.11: Overall measurement model of the study constructs

BC = Business Continuity; MC = Management Commitment; RMG= Risk Management Governance; RMP = Risk Management Process; RMC = Risk Management Culture

The validity of the final measurement model is provided in Table 4.19. The table presents details on the load factor of the individual indicators on their respective constructs, deleted objects, the construct's composite reliability, and each construct's respective AVE.

Table 4.19: Validity for the research model's constructs

Construct	Items	Estimate	AVE
Business Continuity	BC1	.684	.802
	BC2	.557	
	BC3	.557	
	BC4	Item deleted	
	BC5	.734	
	BC6	.879	
	BC7	.853	
	BC8	.809	
	BC9	.906	
	BC10	.904	
	BC11	.775	
Management Commitment	MC1	Item deleted	.871
	MC2	.837	
	MC3	.807	
	MC4	.734	
	MC5	.717	
	MC6	.766	
	MC7	.627	
	MC8	.570	
	MC9	Item deleted	
	MC10	Item deleted	
Risk Management Governance	RMG1	.655	.783
	RMG2	Item deleted	
	RMG3	.611	
	RMG4	.662	
	RMG5	Item deleted	
	RMG6	.849	
	RMG7	.867	
	RMG8	Item deleted	
	RMG9	.619	
	RMG10	.657	
	RMG11	Item deleted	
	RMG12	Item deleted	

Table 4.19: Validity for the research model's constructs (continued)

Construct	Items	Estimate	AVE
Risk Management Process	RMP1	.761	
	RMP2	.793	
	RMP3	.811	
	RMP4	Item deleted	
	RMP5	.816	
	RMP6	.774	.765
	RMP7	.711	
	RMP8	Item deleted	
	RMP9	Item deleted	
	RMP10	Item deleted	
Risk Management Culture	RMC1	Item deleted	
	RMC2	.855	
	RMC3	.813	
	RMC4	.723	
	RMC5	.807	
	RMC6	Item deleted	
	RMC7	Item deleted	
	RMC8	.606	
	RMC9	.602	
	RMC10	Item deleted	.873

4.6.4 Structural model evaluation

To establish the causal relationship between the exogenous and the endogenous constructs, the next step in the SEM research involved the assessment of the structural equation model after fulfilling the criteria for measurement model validity. The structural relationship between the constructs in the research framework was assessed using the AMOS graphics in line with the working hypotheses outlined in chapter two.

The initial performance of the structural model can be seen in Figure 4.12. It is evident from the figure that although other fitness indexes were reached, certain indexes did not reach the appropriate standard. For instance, all the factor loadings observed and their corresponding square multiple regression meet the necessary

thresholds of .50 and .30, respectively. The RMSEA and p-value met the acceptance requirements concerning the fit indexes, while the CFI, GFI and other indicators recorded values below the appropriate thresholds. This indicates there was a need for model re-specification.

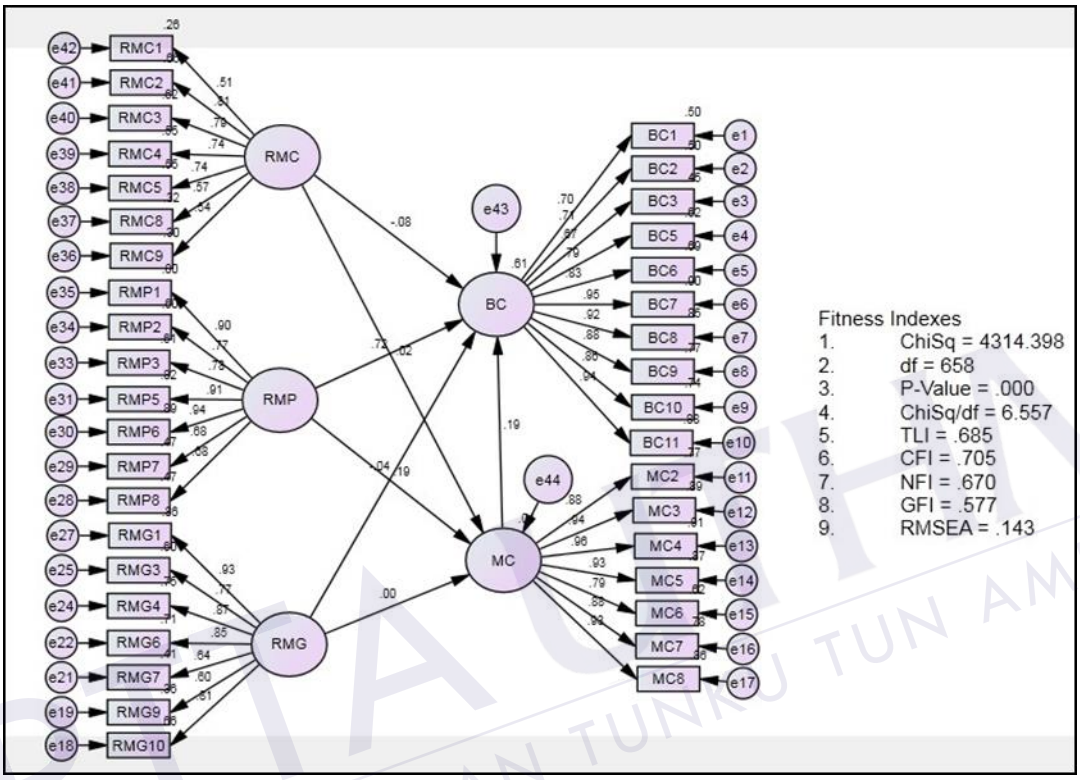

Figure 4.12: Initial structural model

BC = Business Continuity; MC = Management Commitment; RMG= Risk Management Governance; RMP = Risk Management Process; RMC = Risk Management Culture

The final structural model is represented in Figure 4.13. The model fulfilled all the criteria for model acceptance, as shown in the figure. The suggested thresholds were reached by uniform regression weights, squared multiple regression, and all the goodness-of-fit indexes. After an iterative method of model re-specification, the final structural model was arrived at. It demonstrates the causal impact of Risk Management Culture, Risk Management Mechanism, and Risk Management Governance as the exogenous constructs on the Business Continuity endogenous construct and the Management Commitment mediator construct.

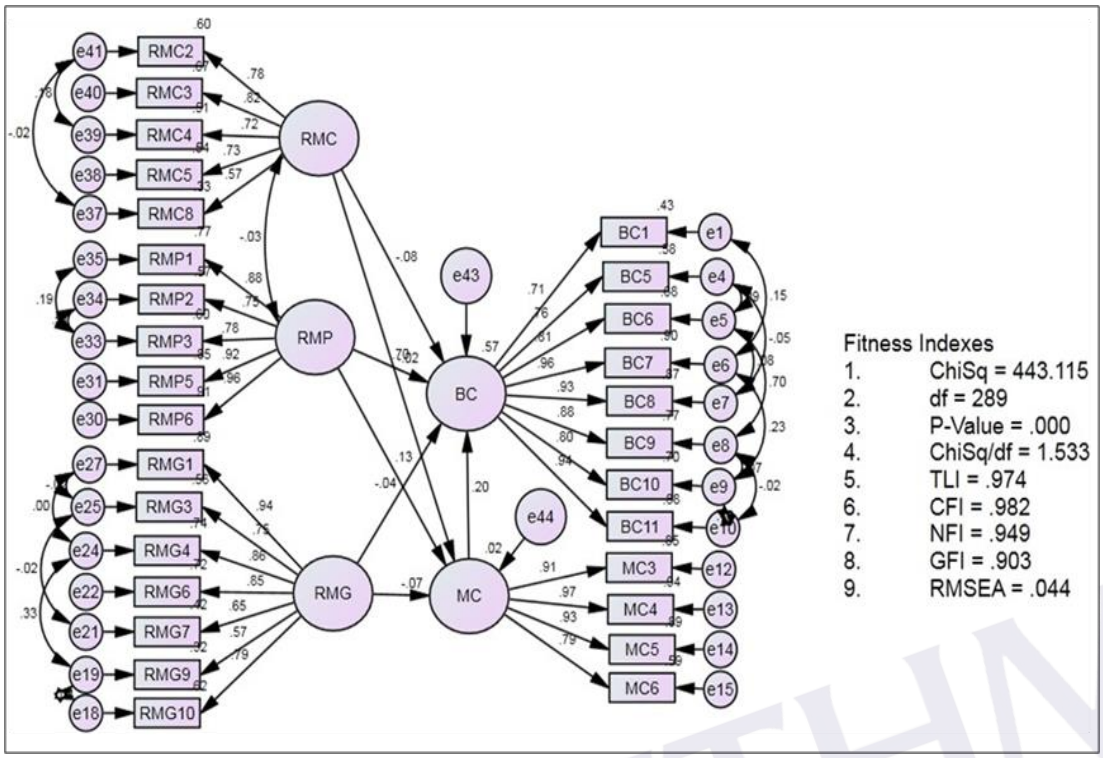

Figure 4.13: Final structural model of the research constructs

BC = Business Continuity; MC = Management Commitment; RMG= Risk Management Governance. RMP = Risk Management Process; RMC = Risk Management Culture

For both the initial and final structural models, Table 4.20 describes the goodness-of-fit indexes. Apart from the economic fit and one of the absolute fit indexes, RMSEA, as shown in the table, the remaining fit statistics did not reach the desired thresholds, so the need for re-specification of the model was felt. Until all the fitness indexes were within the permissible limits, the initial structural model was then iteratively re-specified. After the improvements, the final structural model was reached, with all the fitness indexes reaching the necessary thresholds.

Table 4.20: Goodness-of-fit Indexes for initial and final structural models

Category	Parsimonious fit	Absolut e fit	Incremental fit	Increment l fit	Absolut fit	Comment
Fitness Indexes	Chisq/df	GFI	CFI	NFI	RMSE A	
Acceptance	Chisq/df≤	GFI ≥	CFI ≥ .90	NFI ≥ .90	RMSE	
Threshold	5.0	.90			A ≤ .08	
Initial Structural Model	6.557	.577	.705	.670	.143	Fitness level not achieved, model not accepted
Final Structural Model	1.533	.903	.982	.949	.044	Fitness level achieved, model accepted

4.7 Evaluation of direct relationships

4.7.1 Addressing Research Objective One

The current sections cover key findings for addressing the various research objectives, as stated in Chapter One. Initially, the association between risk management culture and business continuity has been explored as a direct linkage, for which findings have been presented in Table 4.21. The findings show that the coefficient of risk management culture is −.079, which indicates a negative impact of RMC on business continuity in the Tawam Hospital of UAE. More specifically, the standard error value for the stated coefficient is .066, with a critical ratio of −1.966. This would reflect a significant and negative impact of risk management culture on business continuity. More specifically, one unit change in the value of risk management culture is dealing towards an adverse impact of 0.066 on BC and vice versa. In this regard, the first objective has determined the relationship between RMC and BC in the Tawam Hospital of UAE. The adverse impact of RMC on BC reflects a significant need for the management of risk culture in an appropriate way, specifically in the Tawam Hospital of UAE. Although the coefficient is negatively significant, the first research objective has been achieved, which determines the association between risk management culture and BC in the context of UAE hospitals.

4.7.2 Addressing the Second Research Objective

The second research objective has been determined under chapter one to address the association between risk process and business continuity. The findings have been provided in Table 4.21, where it is observed that the coefficient of the risk management process is .695, which shows that there is a positive impact of RMP on BC in the public hospital of UAE. More specifically, the standard error value for the coefficient of 0.695 is 0.053 which helps achieve the critical ratio of 11.148. This would reflect a positive and significant impact of the risk management process on business continuity which means that higher RMP in the Tawam Hospital of UAE is leading towards more business continuity and vice versa. More specifically, one unit change in the value of RMP is causing a positive change of 0.695 in the business continuity of public hospitals in the UAE. The positive coefficient of RMC justifies a proper risk management process followed by public health firms like Tawam Hospital in UAE, which in turn caused fruitful results like business continuity in recent years. As the coefficient for the association between the risk management process and BC is found to be positively significant, the second research objective has also been achieved.

4.7.3 Addressing the Third Research Objective

The third research objective determines the relationship between risk management governance and business continuity from the context of Tawam Hospital in UAE. The results have been covered in Table 4.21, where it is observed that the coefficient for the RMG is −.045 with a standard error of .076. This would claim that there is a negative impact of risk management governance on business continuity in the Tawam Hospital of UAE. Moreover, the value of the critical ratio for the coefficient of RM governance is −1.143, far below the threshold level of 1.96, as determined in the existing body of literature. More specifically, the p-value for the stated coefficient of RMG is .253, indicating insignificant output either at 1% or 5%, respectively. This means an insignificant impact of risk management governance on BC of public firms like Tawam Hospital in the region of UAE. As the coefficient of RMG is found to be

negatively insignificant, it is claimed that the third research objective has not been achieved in a meaningful manner.

Meanwhile, the rest of the findings in Table 4.21 cover that management commitment significantly impacts the business continuity of the Tawam Hospital working in the region of UAE. More specifically, the results have shown that a one percent change in the value of management commitment is leading towards an overall change of 0.20% in the value of business continuity in the Tawam Hospital of UAE. The positive and significant sign of the coefficient confirms that the direct relationship between management commitment and business continuity exists where the p-value is 0.000, significant at 1%.

Table 4.21: Standardized regression weight of the path relationship

Path relationship	**Estimate**	**S.E**	**C.R.**	**P-value**	**R^2**
BC ←RMC	-.079	.066	-1.966	.049	
BC ← RMP	.695	.053	11.148	***	
BC ← RMG	-.045	.076	-1.143	.253	
BC ←MC	.200	.047	4.346	***	.57
MC ←RMC	-.016	.087	-.294	.769	
MC ←RMP	.129	.050	2.153	.031	
MC ←RMG	-.074	.098	-1.412	.158	.02

***indicates significance at p<.05

BC = Business Continuity; MC = Management Commitment; RMG= Risk Management Governance; RMP = Risk Management Process; RMC = Risk Management Culture

4.8 Evaluation of the indirect relationship

4.8.1 Addressing the Fourth Research Objective

The bootstrapping approach was used to assess the mediation impact of Management commitment on the relationship between risk management culture, process, governance, and business continuity. The bootstrapping method was defined as the most efficient method of mediation testing against the Sobel Test method (Hayes, 2014). The process involved re-sampling the working data, set between 500 and 1000 times the sampling distribution, from which the total effect, direct effect and indirect effect estimates, and the corresponding confidence interval values of 95 percent were obtained. The algorithm and the lower and upper limits, and the two-tailed important values for the effects.

In the research model, Table 4.22 shows the bootstrapping outcome for measuring the mediation effect of MC. As shown in the table, no mediation effect on the relationship between RMC and BC is shown by MC (β=-.003; 95% CI: −.027~.018; p=.545). More specifically, the coefficient value for the mediating effect of MC between RMB and BC is −0.003, indicating negative results. It means that with the presence of MC, the relationship between RMC and BC is found to be negative but with a low coefficient size. More specifically, the p-value is 0.545, which is insignificant at 1% and 5%, respectively. Therefore, the stated findings have covered the fact that there is no mediating effect of MC on the relationship between risk management culture and business continuity

In addition, the findings in Table 4.22 reflect that the coefficient for the mediating effect of MC on the relationship between the risk management process and business continuity is 0.026, indicating a positive output. Moreover, the p-value of the stated coefficient is 0.024, which reflects that the empirical findings are significant at 5%. It means that MC has a significant and positive mediating effect on the relationship between the risk management process and business continuity in the Tawam Hospital of UAE. More specifically, the direct impact of management commitment on business continuity is also found to be positively significant, as shown in Table 4.21. Therefore, the direct and indirect mediating effect of management

commitment is accepted specifically from business continuity and risk management processes.

Table 4.22: Two-tailed significance of bootstrap confidence interval for indirect effect

Path relationship	Estimate	Lower Bounds	Upper Bounds	P-value
BC ←MC←RMC	-.003	-.027	.018	.545
BC ← MC←RMP	.026	.003	.075	.024
BC ← MC←RMG	-.015	-.049	.007	.142

BC = Business Continuity; MC = Management Commitment; RMG= Risk Management Governance; RMP = Risk Management Process; RMC = Risk Management Culture

4.9 Findings and Discussion for the Fifth Objective

Initially, some demographic details for the respondents selected for the questionnaires have been provided in Table 4.22 based on their assigned title, marital status, level of education, age, and strategic positions in the Tawam Hospital, UAE.

The results in Table 4.22 cover that five individuals have been contacted for a survey ranging from title A to E. Moreover, out of five, four respondents have their married status, whereas 3 have their level of education as above 16 years. Lastly, 2 respondents are above 40 years, whereas the rest of three have their age between 30 to 40 years, respectively

Table 4.23: Respondent Profile

Case	Title	Marital Status	Education	Age
1	A	Married	16 years	30-40 Years
2	B	Single	Above 16 years	40+
3	C	Married	16 years	30-40 Years
4	D	Married	Above 16 years	40+
5	E	Married	Above 16 years	30-40 Years

4.10 Discussion of the Findings

As stated earlier, this study has collected information and personal views related to business continuity from the context of Tawam Hospital with the help of five respondents. Based on the discussion with the selected respondents, the overall factors and key indicators, as highlighted by the respondents, have been divided into three major categories for which details are given below:

4.10.1 Personal Factors for the Business Continuity

In terms of personal factors contributing to business continuity, all five respondents have highlighted that work-life balance, education and training, and experience are key players in this regard. More specifically, for the work-life balance, it is quite important to consider the work-life enrichment, work-life conflict, awareness, knowledge about the business and its current operations, expertise, personal skills and knowledge, behaviour, attitude and dealing with the other individuals within the organization. Moreover, respondents have further clarified that these factors play a key role in motivating individual employees and managers towards the success of the business and sustainable operational activities. Respondents have further stated that towards the success and continuity of the organization, the role of human resource management is quite important; therefore, personally driven motivational factors have their major role. However, the importance of the different keywords utilized by the respondents during their discussion, specifically from the context of personal factors, has been further highlighted in Figure 4.14, where the world count as utilized by all five respondents has been provided. This graph indicates that, on average, all five respondents have given a % score of 62 to the work-life balance factor, which means that most of the preferences by the selected respondents have been given such personal dynamics for achieving a sustainable business outlook. Meanwhile, during the discussion with the respondents, it is observed that all five respondents have used 20 times the world's personal experience as a key indicator towards business continuity. However, the factors like knowledge and skills got 6% and 7% of attention from the

respondents while providing their views. Moreover, it is observed that all five respondents gave 28 times their attention towards the attitude as a personal factor in leading towards business success or failure during the session.

Figure 4.14: Respondent's View Regarding Personal Motivation Factor

4.10.2 Social Factor of Business Continuity

In addition, respondents were also asked about social factors and their role towards business continuity. For this purpose, all five respondents have given a diversified opinion during the questionnaire distribution session. For instance, respondent A, C, and D has a major focus on the social identity of the organization and interaction with the other community members as the sole indicator for business continuity, whereas respondent B and E are in favour of actively working towards the social responsibility of the Tawam Hospital as a leading factor towards business continuity. Additionally, these respondents have also focused on the keywords like social recognition of the hospital, social repute, social status, and psychological support from different community members towards the Tawam Hospital. Moreover, Figure 4.15 provides a

better look at the preferences being given by the respondents when answering the questionnaires distribution session regarding the social factor of business continuity

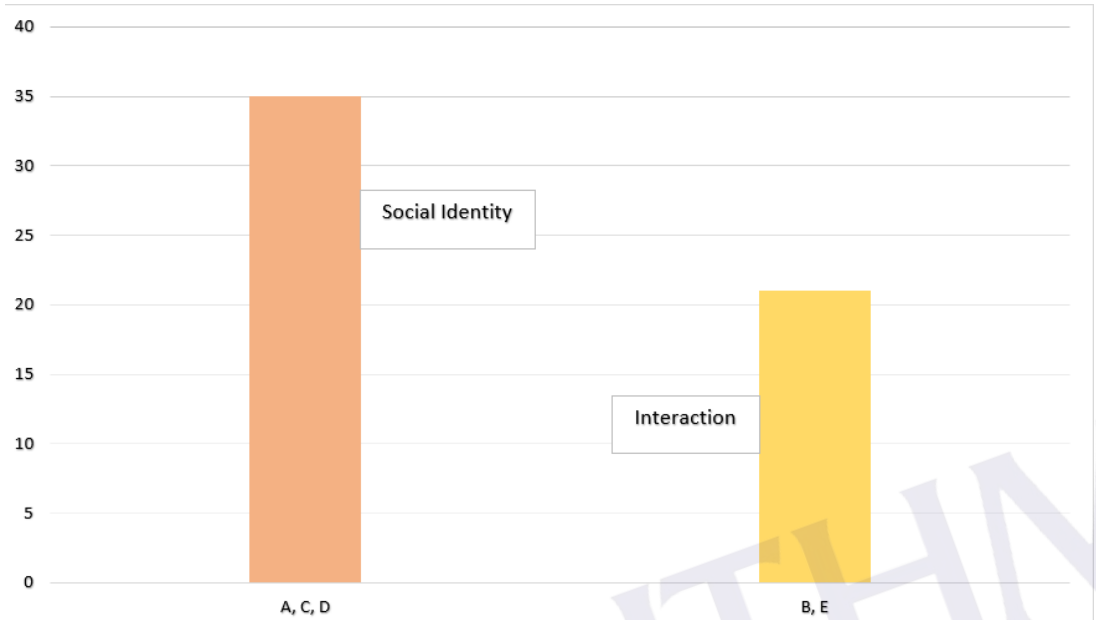

Figure 4.15: Respondents' view regarding the social factor of Business Continuity

4.10.3 Environmental Factors of Business Continuity

In addition, respondents have also highlighted the significance of various environmental factors as among the core indicators of business continuity from the context of Tawam Hospital. During the analysis session, respondents were asked to highlight the key environmental factors linked with business continuity and their organizational significance. Based on the horizon of environmental factors, the respondents have stated that the role of the overall business environment, market situation, governmental organizations, support from non-governmental organizations (NGOs), and market risk factors are crucial to consider. Additionally, governmental support is regarded as developmental support, and some financial assistance on a regular basis is quite required for sustainable business operations in Tawam. At the same time, respondents have also expressed that support from NGOs is another indicator to support for the business continuity in the Tawam Hospital of UAE.

However, respondents gave mixed views on these environmental factors during the discussion. Similar keywords have been combined to present a better outlook through Figure 4.16, specifically from government support as an environmental factor towards business continuity. Similarly, Figure 4.17 and 4.18 also reflects the number of times the selected respondents have utilized the keyword of support from NOGs and market risk.

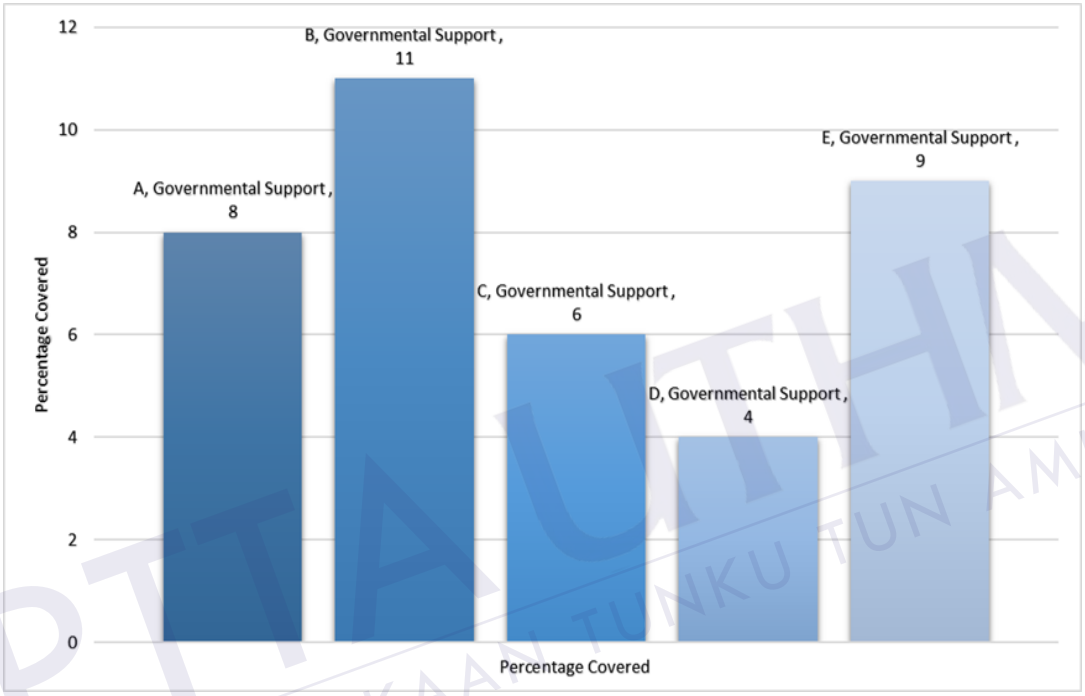

Figure 4.16: Respondent View for the Governmental Support as Environmental Factor towards Business Continuity

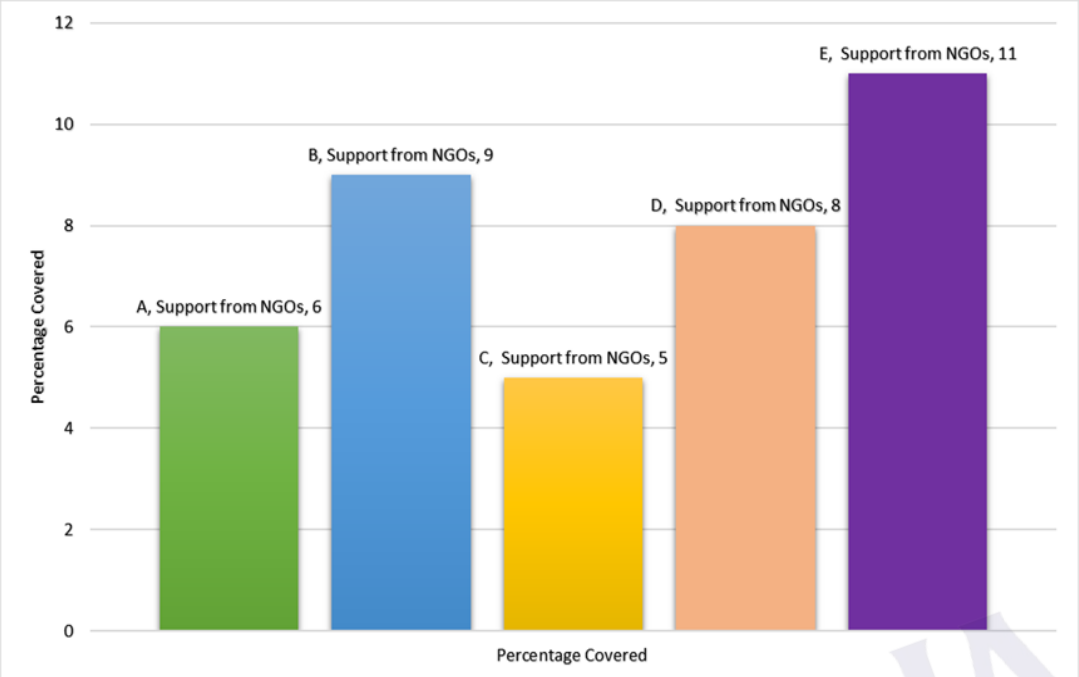

Figure 4.17: Respondent View for the NGOs' Support as Environmental Factor towards Business Continuity

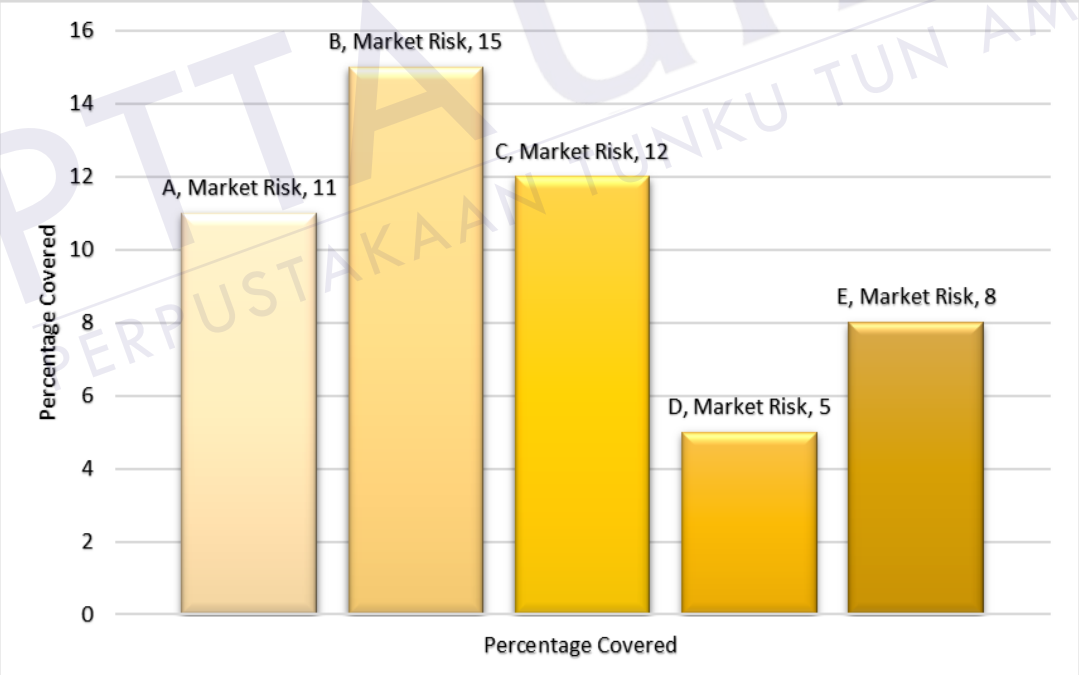

Figure 4.18: Respondent View for the Market Risk as Environmental Factor towards Business Continuity

4.11 Summary of the Chapter

The chapter began by offering a brief introduction and subsequently discussed the questionnaire administration analysis. The second section of the chapter presented an analysis of the demographic information of the respondents, while section three provided a preliminary analysis which is necessary before going deep into the main analysis. The preliminary data screening involved analysis of univariate and multivariate normality, missing value analysis, and descriptive statistics. The remaining sections presented the main analyses that answered the research questions raised through the Structural Equation Modeling approach.

CHAPTER 5

DISCUSSION, RECOMMENDATIONS AND CONCLUSIONS

5.1 Introduction

This chapter ends and offers ideas for future studies. It begins with a brief discussion of the report, outlining how the goals were achieved. The end of the research work is illustrated, and the achievements are often presented in terms of contributions. Finally, with some suggestions for further study and a conclusion, the chapter presents the drawbacks of the research.

This research involved an empirical study of the impact of risk management in public hospitals in the UAE on the phenomenon. A new research framework encapsulates theoretical reasoning from the basic literature review. The main research questions underpinning this dissertation were:

a) What are the effects of risk management culture on the business continuity of public hospitals in the United Arab Emirates (UAE)?
b) What are the effects of the risk management process on the business continuity of public hospitals in the UAE?
c) What are the effects of risk management governance on the business continuity of public hospitals in the UAE?
d) What is the relationship between management commitment, risk management practices, and business continuity of public hospitals in the UAE?

The primary objective of this research was to determine the mediating effect of management commitment on the relationship between risk management and

business continuity of public hospitals in the UAE to develop a conceptual framework showing the possible effects of risk management structure, process, and governance on the business continuity of public hospitals in UAE.

A systematic analysis of theoretical literature was undertaken to answer this research question and to achieve the research target. All applicable directions to identifying the predictors of risk management and business continuity were consolidated in Chapter 2. A quantitative analysis model was built by combining the review streams in Chapter 3, and a model for deeper insight into risk management was proposed.

The quantitative models have been checked and compared with the primary data obtained in Chapter 4, and the findings are addressed in this current chapter. Furthermore, in an attempt to discuss the study's theoretical and practical consequences and contributions, the results of this analysis are summarized. The section ends with a summary of the study's weaknesses and possible directions for science.

5.2 Summary of the Findings

Chapter four discussed the results of this study, in which the researcher explained in detail how he accomplished the goals by designing the measurement and structural models to accomplish all the research goals.

Risk management is also key in creating, growing, and maintaining effective business continuity. Technology plays an important role. However, understanding business strategies is important for business continuity, but scholars have ignored them in specific contexts. It was also seen that behind business strategies, certain guiding forces could be considered in a model to validate the contentions.

To narrow down the research issue, a systematic literature review was undertaken to define the antecedents of risk management and business continuity in several different contexts, including those unique to the context of a developing world and, in particular, hospitals. Risk management culture, mechanism, and governance have been described as potential antecedents. In order to validate the proposed effects of these risk management relationships on business continuity in UAE public

hospitals, a research model has been developed. In the model for empirical research, some interrelationships between these variables and the mediating function of management engagement were also suggested.

Therefore, a quantitative computational model was developed, integrating the most important factors for validating the model with richer in-depth data analysis. A quantitative competitive model with the same context was also developed, as discussed in Chapter 2 (Section 2.16 Research Structure and Hypothesis), to check the contention of the mediating role of management involvement in the relationship of business continuity. The proposed competing model linked the commitment of management to demonstrate the mediating role of management's commitment to business continuity. Methodological appropriateness was important in evaluating the proposed models to achieve the research goal. Therefore, primary data were collected in an observational setting from a cross-section of the UAE Government Sector to be a particular Tawam Hospital.

Regarding the economic model fit and explanatory strength, the proposed and competing models were tested using AMOS, and the suggested model with some adjustments was found to be better than the competing model. The fit indices of the proposed updated model indicate a very strong model fit.

This model's outcome was addressed in Chapter 4. Two paths were found to be essential and logically justified among the hypothesized paths in the updated proposed model. In short, the updated proposed model performance showed that the risk management culture has a clear and constructive relationship with business continuity.

Similarly, the updated proposed model performance showed a clear and optimistic predictor of business continuity in the risk management process. In addition, risk management governance has, as expected, a beneficial impact on the business continuity of the UAE Tawam Hospital.

Regarding the fourth objective, management commitment did not show any mediation effect on the relationship between risk management culture and business continuity. However, it positively mediates between risk management governance and business continuity. There is also a positive mediation for risk management governance and business continuity.

Therefore, the study achieved the four objectives formulated in the first chapter based on the statement of the problems. Also, the study methodology followed the conceptual framework, and the study objectives were achieved.

5.3 Discussion of the Findings

The current study aimed to investigate the effect of risk management practices on the business continuity of a public hospital in the UAE. The investigation was within the scope of the impact of risk management practices, which are risk management culture, process, governance, and commitment, on business continuity. These factors are the independent variables, and management commitment was used as a mediator between business management practices and business continuity.

The first research objective and discussion of the findings have covered the relationship between risk management culture and business continuity. The empirical findings have been covered in Chapter Four.

The findings showed that risk management culture has a direct positive impact on business continuity. This finding is in line with past studies, such as Clay-Williams *et al.* (2020), who argued that the culture of health organizations is essential to improve hospital outcomes. So, risk management in hospitals requires an understanding of the organisation's culture, such as leadership and teamwork (Braithwaite et al., 2017), to improve the organisation's performance and business continuity. The study's findings show that effective risk management needs to build a strong risk management culture in hospitals, and this means creating a solid base for conscious risk management so that all workers are aware of their duties and involved in forming a strong risk management culture. This finding is also in line with Domańska-Szaruga (2020), who argued that risk culture is essential for risk management and requires constructing the behavioural patterns among employees and risk management infrastructure and mechanisms to manage organizational risks effectively. According to Jastrzębska et al. (2014), in risk management, risk culture seems to be absent in risk management, which usually leads to the deterioration of the organizations. They believe that risk management needs to focus on risk culture, such as the duties of risk managers and risk owners, as well as the ideas and support of the staff for risk management, which

is in line with the study's findings. Hence, risk management culture is important to better understand the organization's and the staff's capabilities and involve all the staff in the risk management activities.

The second objective aimed to investigate the effect of the risk management process on the business continuity of public hospitals in the UAE. The study's findings showed that the factor risk management process has a direct positive impact on the business continuity of public hospitals in the UAE. The findings of this objective align with past studies that the risk process is essential for risk management since it helps to make the response to any risk systematic through the identification of the risk, analyzing the risk, and taking an accurate decision to overcome the risk. Rausand (2013) argued that the risk process requires a transparent risk analysis process, and it needs to be clear to all the shareholders to overcome organizational risks. An important point in the risk process is that the risk management process needs to be flexible according to the changes in risk-related factors. This will allow managing the occurrence probability of incident changes based on the new changes, and this adaptation makes the risk management process more dynamic to overcome organization risks (Bex & Hovestad, 2016). This assures the importance of the risk management process to adapt to the changes for better risk management because the risk process is involved in all the stages of risk management, starting from the preparation stage, moving to risk identification and analysis, and risk control. This makes the risk process a vital element in risk management (Hayne & Free, 2014; Qazi & Akhtar, 2020) because it is involved in all the stages of risk management, such as analysis and decision. Accordingly, risk management cannot be achieved with the risk management process to highlight the risk, deal with them, and adapt to the changes in risk and risk outcomes. These processes ensure the business continuity of the organizations.

The third objective aimed to investigate the impact of risk management governance on the business continuity of public hospitals. The analysis showed that risk management governance positively affects the business continuity of Tawam Hospital in UAE. This finding shows that risk management requires not only planning the process and the steps to be taken to overcome the organization's risks but also it is important to understand the organization's capabilities to implement the risk management processes to achieve the goal of overcoming the organization's risks, which is in line with Hopkin (2018). So, it is essential to understand the organisation's

capabilities against risk management structures, risk management division, organization, and industry to get a full picture of the success of risk management (Durugbo, 2013; Benedettini *et al.*, 2015; Wallin *et al.*, 2015). Besides, the finding of the importance of risk governance is in line with the study of Alhammadi et al. (2020) that risk governance helps to control the process of risk management by ensuring its effective performance by employees, agents, and senior management, who are involved in different activities such as identifying the risks and ranking them according to their seriousness to take preventive measures for the sake of mitigating these risks and monitoring the management risk whole activities. Accordingly, risk governance ensures the effectiveness of all the workers' activities by all the workers' activities by dividing the job and following the processes related to risk management to avoid risks and improve business continuity. However, weak risk governance might lead to failure of risk management, which impacts business continuity (Suresh *et al.*, 2020).

The fourth objective aimed to investigate the mediation role of business commitment between risk management practices (risk management culture, process, and risk management governance) and business continuity. The findings showed that management commitment did not mediate the relationship between risk management culture and business continuity. However, it positively mediates between risk management governance and business continuity. There is also a positive mediation for risk management governance and business continuity. Generally speaking, business commitment has a mediating impact on the relationship between two factors (risk management process and risk management governance) and business continuity. This supports considering business commitment as a key factor of successful crisis management, which is in line with many past studies (Wijethilake & Lama, 2019; Mahama *et al.*, 2020; Mashi et al., 2020). The responsibility of crisis management might be attributed to the organization's top management and figures, that are considered to be the organisation's leaders (Sadgrove, 2016; Choi & Cho, 2020). Generally, the risk management process and governance cannot be carried out without leaders to organize the whole process. Therefore, the shortcomings in implementing risk management are greatly attributed to leadership commitments (Hopkin, 2018; Hubbard, 2020).

Finally, the four objectives of the study are interrelated to each other as major practices of risk management to improve the business continuity of public hospitals in the UAE. The findings of all the objectives (risk management culture, risk

management process, and risk management governance) showed that they positively impact business continuity. Therefore, all the study factors of risk management are important to improve the business continuity of public health organizations in the UAE. More specifically, the study's fourth research objective is the mediating effect of management commitment on the relationship between risk management culture, risk management governance, risk management process and business continuity. The empirical findings have covered that the mediating effect of management commitment on the relationship between risk management process and business continuity has been accepted only due to significant output. However, the findings have not justified the mediating effect of management commitment on the relationship between risk management culture, risk management governance, and business continuity from the context of Tawam Hospital as working in the region of UAE.

In addition, the current research has also considered the quantitative research methods for exploring the respondents' views regarding the key determinants of business continuity in the Tawam Hospital, UAE. In this regard, five respondents working in different managerial positions have been selected as there is no restriction for the minimum or maximum number of respondents in the quantitative research methods. The respondents were asked to examine the key factors towards business continuity while maintaining the current situation of the UAE's economy. In this regard, the respondents identified three major factors: personal, social, and environmental factors having their major role towards business continuity from the context of UAE. More specifically, the study findings have been presented with the help of graphs which claim that for the social factors, the key indicators are work-life balance, experience, knowledge, skills of the employees, and attitude, where the highest rank is given to work-life balance by the very first respondents entitled as A. This would indicate that to continue the business for a longer period, it is obvious to provide an overall environment with a good balance both for work and personal life. Additionally, the title of experience has been given much priority by respondent B, who used this keyword 20 times during the analysis session.

On the other side, for the social factors, the findings through the analysis session reflect that respondents A, C, and D have used 35 times the word social identity as a key indicator of business continuity, meaning that more attention should be paid towards this strategic indicator as focused by the 3 respondents out of five. However, the interaction factor with the society and community members has been utilized as 21

times only by B and E respondents, which also justifies its significance. At the same time, respondents have also focused on the environmental factors as key role players towards business continuity from Tawam Hospital, UAE. The findings reveal that governmental support, support from NOGs, and market risk are some of the key indicators of business continuity in Tawam Hospital, UAE.

5.4 Theoretical and Managerial Implications

As reported in Chapter 4 and summarized in the previous section, the study findings have several theoretical and managerial implications.

5.4.1 Managerial Implications

The managerial implications largely emerged from the results in terms of what factors are important in business continuity to strengthen the relationships of the variables found and how to optimize the business advantage. The direct and indirect effect of risk management on business continuity was negated by SEM performance in the same vein, although these two are moderately correlated (r = .34).

Based on the SEM results (Chapter 4), the standardized regression coefficients with the endogenous construct of business continuity of the direct relationships of risk management community, risk management method and risk management governance and management commitment. Similarly, direct partnerships have been shown to have beneficial results. This means that the mediating construct (management commitment) and the three exogenous constructs (risk management culture, risk management mechanism, and risk management governance) clarified 87% variance in Tawam Hospital's business continuity in the UAE. In addition, the results also define the path connection between the mediator construct, the commitment of management, and the three exogenous constructs (risk management culture, risk management process, and risk management governance). As a result, it is shown that less than 1% variability in

management commitment to business continuity in Tawam Hospital UAE was clarified by the three exogenous constructs collectively.

It is important to note that UAE Tawam Hospital should realize that in developing sustainable high levels of business continuity, risk management components and management commitment are essential. More significantly, the findings indicated that the UAE Tawam Hospital should recognize that risk management components/determinants play an important role as a core premise of business continuity, where management engagement affects the partnership.

This means that management engagement does not mediate the relationship between risk management and the opportunistic behaviour of business continuity. In addition, the UAE public hospitals need core attention to building and managing risk management for successful business continuity. UAE public hospitals should emphasise risk management to prevent any adverse impact of confusion and opportunistic tendency to enhance business continuity.

At the same time, the current study has also provided some other managerial implications. For instance, this research would be quite helpful for developing some strategic policies by the owners/managers and hospital management in achieving business continuity, specifically in Tawam Hospital, UAE. More specifically, focusing on the proper risk management practices under the shadow of process, culture and governance dynamics would help sustain the positive results in the form of continuous business operations by the Tawam Hospital of UAE.

Moreover, this study also provides a good implication from the context of management of public sector firms like hospitals. For this purpose, governmental representatives may utilize the association between risk management dynamics and business continuity, where the proper management of risk dynamics may generate strategic results over a longer time. Additionally, the adverse impact of risk management culture and governance on the business continuity highlights that such risk factors should be under more consideration compared to some other indicators having their influence on business continuity in the region of UAE. Additionally, the stated results are directly beneficial for the hospitals and healthcare units in UAE and generally for other public organisations.

5.5 Implications for the Literature

Theoretical findings outlining the fundamental claims in the literature have, in turn, provided an impetus for exploring risk management backgrounds in an international context. A new theoretical model was tested by incorporating the theoretical approach. The result indicates that risk management determinants are undeniably important to improve business continuity, specifically in the current context of UAE Tawam Hospital.

This research provides an absolute contribution to literature from the point of view of the developing world. The findings and review further indicate that all the established antecedents in a new research setting expanded the directions for using risk management determinants. Theoretical assertions on risk management did not theoretically work in one direction as an indicator of business continuity. Still, the impact on information has emerged with more robust evidence in the other way.

In this respect, practitioners will gain additional insight and guidance into the academic body of expertise embedded in the theory of the internationalization method. The vast majority of the philosophical reasons for certain theoretical arguments obtained empirical validity through this review should be of concern to academic practitioners.

5.6 Contributions of the Research

This research has explored the previous contributions of researchers on proposing a new model based on risk management and business continuity with the mediating role of management commitment. The study has contributed to the effects of risk management on business continuity in UAE public hospitals. Most significantly, on statistical grounds, the developed theoretical model under a new empirical research setting drawn from extant theories satisfies all conditions with the desired fit to the data.

The theoretical contribution of the study lies in investigating the study by reviewing past studies to develop the conceptual framework and the items of the

survey to achieve the study objectives. The conceptual framework, the development of the study questionnaire, and the data analysis led to the final structural framework, which can be used to replicate the study in other organizations and other contexts. This contributes since scholars and interested parties can use the study's final structural model as a road map to investigate risk management. Moreover, the significance of the study's findings shows that the study's variables can provide a better understanding of the effects of risk management in business continuity: risk management culture, risk management process, risk management governance, and management commitment. Another theoretical contribution is that the current study and its findings can help scholars and academics gain a better insight into risk management, especially in the UAE, because no similar study has been carried out in the context of the UAE. So, the study's findings are considered an addition to this area, especially since the study's theoretical framework variables have not been together in a single study, as is the case in the current research. Therefore, this research contributes immensely in the academic context by developing and or proposing a new model on risk management effects on business continuity with the mediating effects of management commitment. This will enhance academic pursuit and help many academicians in their research.

In addition, this study has provided a theoretical contribution from the context of direct and indirect relationships between the variables of interest. More specifically, the stated relationship between risk management culture, risk management governance, risk management process and business continuity has reasonably provided a good addition to the theoretical literature, which is not widely observed. At the same time, the theoretical contribution of the current study also exists while exploring the mediating role of management commitment on the relationship between the independent and dependent variables of interest. Additionally, the current literature has little contribution to the mediating role of management commitment as a mediator between risk management dynamics and business continuity.

Practically, the investigation of the current study provides an in-depth understanding of risk management in public hospitals. Hence, decision-makers and policy-makers can utilize the study findings and recommendations to solve the risk management issue in public hospitals in the UAE.

To conclude, the study has a theoretical or methodological contribution by developing and validating the research questionnaire based on the conceptual framework, which is an addition to the area of risk management to benefit academics,

scholars, and interested readers. Besides, the practical contribution lies in the study findings, which can benefit decision-makers in improving risk management in the UAE

5.7 Limitations of the Research

The present study will focus on the significant public sector, particularly business organizations in United Arab Emirates (UAE). Accordingly, this study concentrates on the impact of risk management tools practised in the public sector in the United Arab Emirates (UAE). This study has chosen the survey method. The study's research method will comprise employees working in different public sectors in UAE. The employees with over five years' involvement in the occupation will be considered because of their higher involvement in it and specific understanding of risk management instruments management activities in the public sector. In addition, the study will be done utilizing the quantitative method for data analysis purposes.

Quantitative data will be acquired through the survey, as mentioned earlier. Along these lines, the risk estimation will be founded on the view of the employees. From the methodological point of view, this study is quantitative and is designed from a positivistic paradigm. Any future research would, subsequently, be of much importance if a mixed-method approach is embraced in such a manner. Further, the study will be completed as a cross-sectional review. Consequently, this study will concentrate on the impact of risk management tools only, specifically for the public sector Tawam Hospitals in the United Arab Emirates (UAE).

Because of its legitimacy and dependability, this study has certain limitations. The most obvious confinement is that the cross-sectional nature of data is utilized as a part of this study. Along these lines, such data normally has several limitations. Surveys and people will utilize the data collection method might raise the question of the reality being reflected in the analysis of such data. Since the study survey is the main instrument for data collection, unexpected parts of the formed data depend upon the respondents' keenness to the section when reacting to the questions. Likewise, the survey will be set up in English, and it might impact understanding if the individual is less proficient in English, even though a questionnaire is available. In any case,

interpreting the survey in Arabic would ease the respondents. However, the genuine significance of every single thing may swing; if that happens, the whole study will be valueless.

The factors will be chosen from the hypothetical structures in the literature. A shortage of literature on risk management in the public sector in the UAE will fill in as confinement in the research procedure. The study does not straightforwardly represent the impact of logical components on risk management tools and public sector performance in organizations. For instance, the risk management apparatuses between organizations are not considered. Plus, the precision of the data collected on risk management tools for the public sector might be influenced by the subjectivity of respondents, which is unavoidable in this sort of behavioural-situated research setting. Besides, the vast majority of UAE organizations rehearse a systematic record-keeping system. This may gravely influence the exactness of the data.

5.8 Summary of the Chapter

This chapter has discussed the main findings and conclusions of the research, from the introduction, literature review, and methodology to data analysis and presentation. Contribution to knowledge and limitations of the research were also included; recommendations for further research were put in place. The research not only contributes knowledge but also creates awareness and updates not only contributes knowledge but also creates awareness and updates people on the effects of risk management on business continuity with the mediating role of management commitment in UAE public hospitals. It is believed that continuous research efforts on risk management and business continuity could contribute to many countries' social, economic, and environmentally sustainable development.

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VITA

My name is Ahmed Saif Al Mansoori and I was born and raised in Alain, UAE. I graduated high school in the year 2000 then joined ZonesCorp as an Assistance Industrial Inspector. Four years later, I movod to Tawam Hospital where I worked as a Patient Affairs and Experience Officer. My job included coordinating activities between the different departments and handling all communications and complaints. In addition to handling patient case management, managing human resources, and providing monthly statistical reports to management. During my time at Tawam, I pursued an Information Technology Bachelor degree in Al Khwarizmi International College as well as an Executive Master of Business Administration degree in the Institute of Management Technology. In 2016, I was promoted to a Risk Officer at Tawam Hospital and maintained that position for three years where I then moved to the Ministry of Foreign Affairs as the Head of Infrastructure. Besides my educational and occupational background, I also pursued several trainings and certifications, including but not limited to the Diplomatic Etiquette and Protocol, Infection Control Competency, Environmental Health and Safety Standards and Risk Management trainings.