



Crisis management component and business continuity management: An empirical study on the Jordanian Ministry of Education

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ABSTRACT

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This study examines the impact of crisis management components on business continuity management (BCM) within the Jordanian Ministry of Education, focusing on the perspectives of senior administrative personnel (department directors, unit managers, directorate managers, and heads of divisions). Given the growing complexity and frequency of organizational crises, the research aimed to assess how the dimensions of crisis management namely forecasting and detection, preparedness and prevention, containment, and recovery affect the Ministry's ability to sustain critical operations. A quantitative, descriptive-analytical approach was employed using a structured questionnaire distributed to the entire study population of 193 supervisory-level staff. A total of 162 valid responses were obtained, achieving a response rate of 83.9%. Data was analyzed using SPSS, applying both descriptive statistics and multiple linear regression techniques. The findings revealed a statistically significant positive relationship between all crisis management components and BCM dimensions, including administrative support, risk assessment, business impact analysis, and awareness and training. Among the components, recovery and business impact analysis emerged as the most influential. These results highlight the importance of proactive crisis planning in enhancing institutional resilience and ensuring service continuity. The study recommends that the Ministry institutionalize early warning systems, conduct simulated crisis drills, strengthen recovery protocols, and invest in comprehensive training programs to equip teams with the skills and resources needed to effectively manage potential crises.

Contribution/Originality: This study contributes to the existing literature by empirically validating the relationship between crisis management and business continuity management in public institutions. By integrating crisis management into strategic planning, it provides a framework for crisis-resilient governance aligned with organizational adaptability and systems resilience theories.

1. INTRODUCTION

Crises are complicated phenomena that disrupt the status quo and operational stability of organizations, particularly educational institutions, which are not immune to sudden or escalating disturbances. Such disruptions often result in the loss of alignment among organizational components, making it difficult for organizations to respond using standard procedures (Al-Muhanna, 2021). The Ministry of Education, as a key public service provider, frequently faces situations that exceed routine control mechanisms, requiring more adaptive and strategic responses.

This reality underscores the growing necessity for structured crisis management systems and proactive resilience-building strategies.

Crisis management is a process grounded in scientific tools that enable organizations to anticipate potential disruptions and mitigate their effects. It includes several key dimensions such as forecasting and detection, preparedness and prevention, containment, and recovery (Abuzyead & Sherif, 2017; Al-Hanafi, 2017; Alzoby, 2019). Forecasting and detection refer to the organizational capacity to identify early warning signs, which, if ignored, may escalate into full-blown crises. Preparedness and prevention involve formulating response scenarios and preemptive actions to minimize potential threats. Containment focuses on executing immediate response plans to control damage and isolate impacts, while recovery refers to the organization's ability to restore operations and stability through both short- and long-term recovery plans.

Business Continuity Management (BCM) has emerged as a critical framework aimed at ensuring organizational resilience. BCM involves identifying risks, analyzing their impact, and developing strategies to maintain essential functions during and after a crisis (Abd Elsalam, 2022). Key components of BCM include administrative support, risk assessment, business impact analysis (BIA), and awareness and training (Al-Najjar & Al-Harayzeh, 2020; Al Ameri & Musa, 2021; Hijjawi & Al-Shawabkeh, 2017). These components ensure that institutions are well-prepared, resources are appropriately allocated, and personnel are equipped to respond effectively.

Within this context, the Jordanian Ministry of Education has taken concrete steps toward institutionalizing crisis management and business continuity planning. Accordingly, the Ministry of Education has developed a crisis and risk management strategy (2023-2027) in line with Jordan's Risk Reduction Strategy (2018-2022), launched by the National Center for Security and Crisis Management (NCSCM), its second version (2023-2030), policies for dealing with changes and crises, and the (Ministry of Education, 2023; Ministry of Environment, 2021).

Empirical studies reinforce the significance of this dual approach. Research has found a strong positive correlation between crisis management strategies and institutional performance (Miz'al, 2020). Other research emphasized the importance of organizational structure and clarity of policies in enhancing crisis responsiveness (Al-Barouni, 2021). Similarly, business continuity practices, aligned with international standards like ISO 22301, are confirmed as key contributors to operational stability and strategic advantage (Chen & Xu, 2023; Sadrabadi, Makui, Ghousi, & Jabbarzadeh, 2024). Despite these research works, there remains a gap in understanding how crisis management practically enhances the ability of businesses to pass through turbulent times. Accordingly, this study aims to explore the availability of crisis management components and how they influence the effectiveness of business continuity in public educational institutions. The study also aims to highlight the extent to which strategic crisis response enhances institutional resilience and continuity of services.

2. THEORETICAL FRAMEWORK

2.1. Crisis Management

Crisis management is a crucial field that combines theoretical knowledge, professional expertise, and practical experience to respond to unexpected and high-impact disruptions. Originally applied in political and economic contexts, the term "crisis" has expanded to encompass institutional threats to operational continuity, reputation, and stability. As educational institutions face increasing uncertainties, effective crisis management becomes essential for sustaining performance (Darwich, 2022; Thaller, Mayr, & Feldbauer-Durstmüller, 2024).

Crisis management is a holistic approach that coordinates organizational capabilities to deal with emergencies in a controlled and systematic manner (Darwich, 2022). It involves anticipating risks, responding to incidents, and minimizing negative consequences through rational planning and resource deployment (Boutora & Louafi, 2022). In such environments, top-level responsiveness is considered urgent (Bin Kheira, 2022) since poor leadership can jeopardize institutional goals (Benan, 2022).

Crisis management encompasses five interrelated dimensions. Early warning signals detection involves continuous data analysis and scenario planning to identify preliminary signs of potential threats (Benan, 2022). Preparedness and Prevention: Institutions must formulate contingency plans and build adaptive capacity to mitigate future crises (Al-Halabi, 2022). Damage containment includes swift actions that are required to limit the crisis's escalation and preserve organizational stability (Alwan, Al-Jumaili, & Najm, 2022). Recovery is the fourth component in which organizations implement restoration strategies to return to normal operations and rebuild affected systems (Al-Hanafi, 2017). Learning and continuous improvement come as a post-crisis evaluation, which is critical for institutional learning and enhancing future preparedness (Al-Suhimat, Al-Htibat, & Awamleh, 2025).

2.2. Business Continuity Management (BCM)

BCM has become an integral pillar in the strategic infrastructure of organizations facing increasing internal and external risks. With the rise of crises such as natural disasters, health emergencies, and technological disruptions, the need for continuous service delivery has become imperative. BCM functions as a proactive framework designed to ensure uninterrupted operations and institutional resilience (Sawalha, 2021).

Initially rooted in IT disaster recovery, BCM has evolved into a broader organizational strategy encompassing risk evaluation, resource planning, and recovery protocols (Al-Najjar & Al-Harayzeh, 2020). It is defined as a comprehensive administrative system that enables organizations to manage potential disruptions and safeguard mission-critical operations (Barnett-Quaicoo & Ahmadu, 2021; Stamenkov, 2022). BCM also aims to preserve institutional reputation and stakeholder trust during adverse events (Ferguson, 2019). BCM further integrates tightly with risk management, focusing on reducing operational vulnerabilities (Sawalha, 2021).

Key dimensions of BCM include (Al-Najjar & Al-Harayzeh, 2020; Al-Shaahin, 2023):

- Administrative support: Senior leadership endorsement is essential for the long-term success of continuity planning.
- Risk Assessment and Mitigation: This involves identifying and quantifying organizational risks to minimize potential losses.
- Business Impact Analysis (BIA): BIA assesses the consequences of disrupted services and guides resource prioritization.
- Recovery and continuity strategies: institutions need clear, actionable plans for restoring suspended activities post-crisis.
- Institutional awareness and training: Ongoing training ensures staff preparedness and promotes a culture of resilience.

This theoretical framework forms the foundation for analyzing how the crisis management component and BCM components intersect to influence institutional continuity, particularly within the Jordanian Ministry of Education.

2.3. Study Problem and Questions

Like other governmental institutions, the Ministry of Education is susceptible to various types of crises that may directly or indirectly threaten its work environment and stability across its departments and affiliated units. Both crisis management and BCM are fundamental pillars within modern administrative strategies aimed at enhancing an institution's adaptability to changes and ensuring the sustainable delivery of services amid potential challenges.

While crisis management focuses on the immediate response to emergency situations and minimizing their negative impacts, BCM ensures the maintenance of minimum institutional performance and critical services during and after the crisis. The integration of these two concepts forms a central approach to achieving efficient and stable public administration.

Therefore, the necessity arises to adopt a systematic scientific approach within the framework of crisis management, based on forecasting, prevention, containment, and recovery ultimately reducing losses and limiting

the negative consequences of potential crises at various administrative levels within the ministry. Accordingly, the central research question is as follows:

What is the impact of the availability of crisis management components (forecasting and detection, preparedness and prevention, containment, recovery) on BCM dimensions (administrative support, risk assessment, business impact analysis, awareness and training) in the Jordanian Ministry of Education?

This primary question is divided into the following sub-questions:

1. What is the level of availability of crisis management components (Forecasting and detection, preparedness and prevention, containment, recovery) in the Jordanian Ministry of Education?
2. What is the level of BCM (administrative support, risk assessment, business impact analysis, awareness, and training) in the ministry?
3. What is the effect of forecasting and detection on BCM?
4. What is the effect of preparedness and prevention on BCM?
5. What is the effect of containment on BCM?
6. What is the effect of recovery on BCM?

2.4. Study Model and Hypotheses

Building on theoretical foundations, this study proposes the following hypotheses. Figure 1 illustrates the study's conceptual framework, linking crisis management to business continuity management. The model tests whether forecasting and detection, preparedness and prevention, containment, and recovery significantly influence administrative support, risk assessment, business impact analysis, and awareness and training through hypotheses H01 to H01.4.

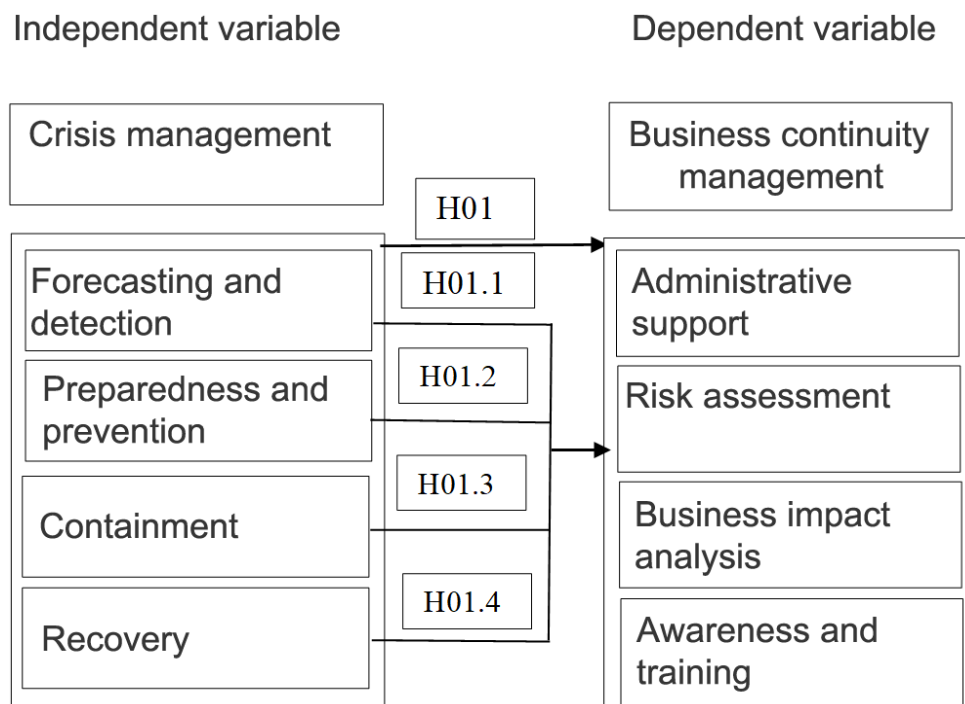


Figure 1. Conceptual framework.

H_{01} : There is no statistically significant impact at the significance level ($\alpha \leq 0.05$) of the availability of crisis management components (forecasting and detection, preparedness and prevention, containment, recovery) on BCM dimensions (administrative support, risk assessment, business impact analysis, awareness and training) in the Jordanian Ministry of Education.

Sub-Hypotheses:

$H_{01.1}$: There is no statistically significant impact of forecasting and detection on BCM.

$H_{01.2}$: There is no statistically significant impact of preparedness and prevention on BCM.

$H_{01.3}$: There is no statistically significant impact of containment on BCM.

$H_{01.4}$: There is no statistically significant impact of recovery on BCM.

3. METHODOLOGY

3.1. Study Population

The current study population includes all individuals holding supervisory positions at the Ministry of Education in Jordan, specifically: directors of departments, unit managers, directorate managers, and heads of sections. The total population size amounted to 193 employees.

3.2. Study Sample

The researchers conducted a comprehensive survey of the entire study population (193 individuals). A questionnaire was distributed to all participants using a full enumeration method. A total of 176 questionnaires were retrieved. After reviewing and screening the responses, 14 questionnaires were excluded due to incomplete responses. This exclusion was not part of the original study design but rather emerged post-data collection during the data-cleaning process to ensure accuracy and reliability, resulting in 162 valid questionnaires for analysis. This corresponds to a valid response rate of 83.9%, which is considered a strong representation of the population.

3.3. Data Collection Sources

To achieve the objectives of both the theoretical and practical aspects of this study, the researcher relied on two main sources for data collection. The first source is secondary data, including books, academic journals, articles, reports, previous studies related to the topic, and various reliable internet sources. The purpose of using secondary sources was to explore sound scientific foundations and approaches in academic research and to gain insights into the latest developments concerning the subject of this study.

The second source is primary data, collected via a structured questionnaire developed based on relevant prior studies. The questionnaire employed a five-point Likert scale (1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 = Always). It was divided into three main parts. Part one focused on demographic variables such as gender, age, academic qualification, years of experience, and job title, aiming to describe the sample's characteristics. Part two related to the independent variable Crisis Management Component comprising four dimensions: (1) Prediction and Detection, (2) Preparedness and Prevention, (3) Containment, and (4) Recovery, with a total of 20 items. Part three concerned the dependent variable BCM, comprising four dimensions: (1) Administrative Support, (2) Risk Assessment, (3) Business Impact Analysis, and (4) Awareness and Training, also with 20 items.

Data were interpreted using the Likert scale categories based on the following formula: Category length = (Maximum value – Minimum value) / Number of categories = $(5 - 1) / 3 = 1.33$. Accordingly, the evaluation levels were determined as follows in Table 1 (Likert, 1932).

Table 1. Likert scale categories.

Score range	Evaluation level
1.00 – 2.33	Low
2.34 – 3.66	Medium
3.67 – 5.00	High

3.4. Instrument Reliability

The internal consistency of the questionnaire was assessed using Cronbach's Alpha coefficient. The results showed that all reliability coefficients exceeded the acceptable minimum threshold (≥ 0.60), with values ranging from 0.808 to 0.903. The overall Cronbach's Alpha coefficient reached 0.974, indicating a high level of reliability suitable

for statistical analysis (Cronbach, 1951). Table 2 presents the reliability results of the instrument. All domains exceed the minimum threshold of 0.60, with Cronbach's Alpha values ranging from 0.808 to 0.903. The overall coefficient of 0.974 confirms excellent internal consistency for statistical analysis.

Table 2. The reliability coefficients for each domain of the instrument.

Variables	Number of items	Cronbach's alpha
Prediction and detection	5	0.808
Preparedness and prevention	5	0.862
Containment	5	0.878
Recovery	5	0.839
Total independent variable (Crisis management)	20	0.943
Administrative support	5	0.869
Risk assessment	5	0.882
Business impact analysis	5	0.879
Awareness and training	5	0.903
Total dependent variable (Business Continuity Management)	20	0.960
Overall reliability for all items	40	0.974

4. DATA ANALYSIS

4.1. Demographic Characteristics of the Study Sample

This section provides a descriptive analysis of the demographic characteristics of the study sample using frequencies and percentages. The results, as shown in Table (3), are presented accordingly.

- The majority of respondents were male, representing 71% of the sample, compared to 29% female participants.
- The educational level of the sample was notably high. Respondents holding a Master's degree accounted for the largest proportion at 36.4%, followed by those with a Doctorate at 33.3%, and Bachelor's degree holders at 30.2%. No participants reported holding a diploma (0%).
- Regarding professional experience, the vast majority of respondents (88.3%) had over 15 years of experience. Only 11.7% had between 10 and less than 15 years of experience. Participants with less than 10 years of experience were excluded due to the lack of data.
- In terms of job titles, the largest group was "Heads of Departments," representing 66% of the sample, followed by "Directors of Directorates" at 21%, then "Directors of Departments" at 11.7%. The smallest group was "Unit Managers," accounting for just 1.2%.

Table 3. Demographic distribution of the study sample.

Variable	Category	Frequency	Percentage (%)
Gender	Male	115	71.0
	Female	47	29.0
	Total	162	100.0
Educational level	Diploma	0	0.0
	Bachelor's	49	30.2
	Master's	59	36.4
	Doctorate	54	33.3
	Total	162	100.0
Years of experience	Less than 5 years	0	0.0
	5 – less than 10 years	0	0.0
	10 – less than 15 years	19	11.7
	More than 15 years	143	88.3
	Total	162	100.0
Job title	Unit Manager	2	1.2
	Department director	19	11.7
	Directorate director	34	21.0
	Head of Department	107	66.0
	Total	162	100.0

4.2. Data Analysis to Answer the Descriptive Research Questions

Research Question 1: What is the level of availability of the crisis management component (early warning signal detection, preparedness and prevention, containment, and recovery) in the Jordanian Ministry of Education from the perspective of the study sample?

This question was addressed by calculating means, standard deviations, and relative importance for each dimension of crisis management, as shown in Table 4.

Table 4. Mean scores and standard deviations for crisis management dimensions (independent variable).

Rank	Dimension	Mean	Std. deviation	Relative importance
1	Recovery	4.20	0.595	High
2	Containment	4.15	0.687	High
3	Early warning signal detection	4.11	0.602	High
4	Preparedness and prevention	4.03	0.747	High
—	Overall mean	4.12	0.580	High

The results indicate a strong perception of preparedness and readiness across all dimensions of crisis management. Recovery ranked the highest, implying that the Ministry prioritizes a rapid return to normal operations after crises. However, the slightly lower score in preparedness and prevention suggests potential areas for further development.

Research Question 2: What is the level of availability of business continuity management dimensions (administrative support, risk assessment, business impact analysis, awareness, and training) from the perspective of the study sample?

This question was analyzed using the same statistical methods, as shown in Table 5.

Table 5. Mean scores and standard deviations for business continuity management dimensions (dependent variable).

Rank	Dimension	Mean	Std. deviation	Relative importance
1	Business impact analysis	4.19	0.675	High
2	Risk assessment	4.15	0.685	High
3	Administrative support	4.13	0.647	High
4	Awareness and training	4.10	0.736	High
—	Overall mean	4.14	0.626	High

All dimensions were rated highly, with Business Impact Analysis receiving the highest mean score, indicating that the Ministry is well aware of the consequences of disruptions. The relatively lower rating in awareness and training suggests the need for improved staff education and preparedness initiatives.

4.3. Ensuring the Suitability of the Study Model

Before testing the study hypotheses using multiple regression, the assumptions of regression analysis were verified through a set of diagnostic tests, including multicollinearity, normality, and autocorrelation. Table 6 displays the Pearson correlation coefficients among the dimensions of crisis management. All correlations are positive, strong, and statistically significant at the 0.01 level, ranging from 0.652 to 0.787. These results confirm the absence of multicollinearity concerns and support the suitability of the study model for regression analysis.

Table 6. Pearson correlation for crisis management dimensions.

Variables	Prediction & detection	Preparedness & prevention	Containment	Recovery
Prediction & detection	1	0.772**	0.674**	0.655**
Preparedness & prevention		1	0.671**	0.652**
Containment			1	0.787**
Recovery				1

Note: (**) Significant at 0.01.

4.3.1. Multicollinearity – Crisis Management Dimensions

The results indicate moderate correlations (all < 0.90), suggesting no severe multicollinearity. Table 7 presents the Variance Inflation Factor (VIF) and tolerance values for the crisis management dimensions. All VIF values range between 2.818 and 3.068, while tolerance values range between 0.326 and 0.355.

These results fall within the accepted thresholds (VIF < 10; Tolerance > 0.1), confirming the absence of severe multicollinearity among the variables.

Table 7. VIF and tolerance for crisis management dimensions.

Variables	Tolerance	VIF
Prediction & detection	0.352	2.840
Preparedness & prevention	0.355	2.818
Containment	0.326	3.068
Recovery	0.345	2.897

All values are within accepted thresholds (VIF < 10; Tolerance > 0.1). Table 8 displays the Pearson correlation coefficients among the business continuity management (BCM) dimensions.

All correlations are strong, positive, and statistically significant at the 0.01 level, ranging from 0.724 to 0.792. These results confirm the internal coherence of BCM dimensions and support the model's suitability for regression analysis.

Table 8. Pearson correlation for BCM dimensions.

Variables	Admin. support	Risk assessment	BIA	Awareness & training
Administrative support	1	0.768**	0.765**	0.724**
Risk assessment		1	0.792**	0.782**
Business impact analysis			1	0.757**
Awareness & training				1

Note: (**) Significant at 0.01.

4.3.2. Multicollinearity – Business Continuity Dimensions

The highest correlation (0.792) is still below 0.90, confirming the absence of high multicollinearity. Table 9 presents the VIF and tolerance values for the business continuity management (BCM) dimensions. VIF values range from 2.884 to 4.842, while tolerance values fall between 0.207 and 0.347. All results meet the accepted thresholds (VIF < 10; tolerance > 0.1), confirming the absence of multicollinearity and supporting the model's suitability for regression analysis.

Table 9. VIF and Tolerance for BCM Dimensions.

Variables	Tolerance	VIF
Administrative Support	0.347	2.884
Risk Assessment	0.207	4.842
Business Impact Analysis	0.223	4.476
Awareness & Training	0.339	2.946

All results confirm model suitability (VIF < 10; Tolerance > 0.1). Table 10 shows the skewness and kurtosis values for all study variables. Skewness values range from -0.980 to -0.084, and kurtosis values range from 0.204 to 1.101. These results fall within the acceptable limits (± 2), confirming that the data are normally distributed and suitable for regression analysis.

Table 10. Skewness and Kurtosis Values.

Variables	Skewness	Kurtosis
Prediction & detection	-0.980	1.101
Preparedness & prevention	-0.883	0.359
Containment	-0.087	0.512
Recovery	-0.747	0.659
Administrative support	-0.124	0.786
Risk assessment	-0.942	0.816
Business impact analysis	-0.943	0.932
Awareness & training	-0.084	0.204

4.3.3. Normality Test

All skewness values fall between -1 and $+1$, supporting the assumption of normality. Table 11 presents the Durbin–Watson test results for the study hypotheses. All calculated values range from 1.702 to 1.934, falling between the lower (dL) and upper (du) bounds. These results confirm the absence of autocorrelation, thereby supporting the assumption of independent errors in regression analysis.

Table 11. Durbin–Watson test.

Hypothesis	D-W calculated	dL	du	Result
Ho1	1.767	1.571	1.679	No autocorrelation
Ho1-1	1.702	1.611	1.637	No autocorrelation
Ho1-2	1.719	1.611	1.637	No autocorrelation
Ho1-3	1.844	1.611	1.637	No autocorrelation
Ho1-4	1.934	1.611	1.637	No autocorrelation

4.3.4. Autocorrelation Test

All D-W values fall within the accepted range, confirming independence of residuals.

Conclusion: The diagnostic tests (multicollinearity, normality, and autocorrelation) confirm that the study data satisfy the assumptions of regression analysis.

This enhances confidence in the robustness and reliability of the subsequent hypothesis testing.

4.4. Hypotheses Testing

This section presents the testing of the study's hypotheses, which aim to determine the relationship between the independent variable Crisis Management (with its dimensions: Early Warning Signal Detection, Preparedness and Prevention, Containment, and Recovery) and the dependent variable BCM (with its dimensions: Administrative Support, Risk Assessment, Business Impact Analysis, and Awareness and Training) from the perspective of the study sample.

H₀: There is no statistically significant effect at the level of significance ($\alpha \leq 0.05$) for the dimensions of Crisis Management (Early Warning Signal Detection, Preparedness and Prevention, Containment, Recovery) on Business Continuity Management in all its dimensions collectively, as perceived by department directors, unit managers, directorate directors, and heads of departments in the Jordanian Ministry of Education.

After confirming the suitability of the data for regression analysis through diagnostic tests (see Section 4.3), the hypotheses were tested using multiple linear regression and stepwise multiple regression.

Table 12. Standard multiple regression analysis effect of crisis management dimensions on business continuity management dimensions combined.

Dependent variables	Model summary	ANOVA (b)	Independent variables	Regression coefficients (a)
R	R ²	df (Regression)	F	Sig. F
0.896	0.803	4	159.938	0.000
Independent variable	B	t	Sig. t	
Constant	0.084	0.487	0.627	
Early warning detection	0.151	2.428	0.016	
Preparedness & prevention	0.180	3.611	0.000	
Containment	0.209	3.704	0.000	
Recovery	0.440	6.945	0.000	

Table 12 shows that all sub-dimensions of crisis management (Early Warning Detection, Preparedness and Prevention, Containment, and Recovery) have a statistically significant effect on Business Continuity Management. The calculated *t* values ranged between 2.428 and 6.945, all significant at ($\alpha \leq 0.05$). The correlation coefficient between crisis management and BCM was $R = 0.896$, while the coefficient of determination was $R^2 = 0.803$, indicating that crisis management explains 80.3% of the variance in BCM. The *F* value (159.938) was statistically significant (Sig. $F = 0.000 \leq 0.05$), confirming the robustness of the model.

Table 13. Stepwise multiple regression results: predicting BCM from crisis management dimensions.

Model	R	R ²	F Value	Sig. F	Included variables
1	0.835	0.697	367.495	0.000	Recovery
2	0.879	0.773	271.001	0.000	Recovery, preparedness & prevention
3	0.892	0.796	204.936	0.000	Recovery, preparedness & prevention, containment
4	0.896	0.803	159.938	0.000	Recovery, preparedness, containment, early warning detection

Table 13 reveals the order of importance of the independent variable "Crisis Management." Recovery entered the model first, explaining 69.7% of the variance in BCM. Adding Preparedness & Prevention increased the explained variance to 77.3%. The inclusion of Containment raised it to 79.6%. Finally, with Early Warning Detection added, the explained variance reached 80.3%. This ranking indicates that Recovery is the most influential predictor, followed by Preparedness & Prevention, then Containment, and finally Early Warning Detection.

Table 14. Regression coefficients with 95% confidence intervals: Stepwise multiple regression (final model – all dimensions).

Dimension	B	t value	Sig. t	SE	95% CI (Lower – Upper)
Recovery	0.440	6.945	0.000	0.063	(0.315 – 0.565)
Preparedness & prevention	0.180	3.611	0.000	0.050	(0.082 – 0.278)
Containment	0.209	3.704	0.000	0.056	(0.098 – 0.320)
Early warning detection	0.151	2.428	0.016	0.062	(0.028 – 0.274)

Table 14 shows that all regression coefficients (B) are statistically significant, with *p*-values ranging from 0.000 to 0.016, all below 0.05. Importantly, all 95% confidence intervals exclude zero, which further confirms the reliability and robustness of the results.

4.5. Final Decision on the Main Hypothesis

The main null hypothesis (H0.1) is rejected, and the alternative hypothesis is accepted: *There is a statistically significant effect of crisis management dimensions on Business Continuity Management dimensions combined at the Jordanian Ministry of Education.*

4.5.1. Sub-Hypotheses Testing

H_{01.1}: There is no statistically significant effect at the level of significance ($\alpha \leq 0.05$) of Early Warning Detection on Business Continuity Management dimensions combined in the Jordanian Ministry of Education, from the perspective of department directors, unit managers, directorate managers, and heads of sections.

Table 15. Simple regression results – Effect of early warning detection on BCM.

Dependent variables	Model summary	ANOVA (b)	Variables	Regression coefficients (a)
R = 0.740	R ² = 0.547	Regression df = 1	F = 193.450	Sig. F = 0.000
		Residual df = 160		
		Total df = 161		
Variables	B	t Value	Sig. t	95% CI for B
Constant	0.983	4.280	0.000	–
Early warning detection	0.768	13.909	0.000	(0.659 – 0.877)

Note: a: Independent variable = Early warning detection.
b: Dependent variable = Business continuity management (Combined dimensions).

Table 15 shows that the correlation coefficient (R) between the two variables Early Warning Detection and Business Continuity Management was 0.740, indicating a strong positive relationship. The coefficient of determination (R²) reached 0.547, which means that Early Warning Detection explains 54.7% of the variance in Business Continuity Management. The calculated F-value was 193.450 at a statistical significance of (Sig. = 0.000), which is below ($\alpha \leq 0.05$). This confirms the significance of the regression model. Furthermore, the regression coefficient (B = 0.768, t = 13.909, Sig. = 0.000) is statistically significant, and the 95% confidence interval for B = (0.659 – 0.877), confirming the robustness of the result.

Based on these results, the null hypothesis is rejected, and the alternative hypothesis is accepted: *There is a statistically significant effect at the level of significance ($\alpha \leq 0.05$) of Early Warning Detection on Business Continuity Management in the Jordanian Ministry of Education.*

H_{01.2}: There is no statistically significant effect at the level of significance ($\alpha \leq 0.05$) of Preparedness and Prevention on Business Continuity Management dimensions combined in the Jordanian Ministry of Education, from the perspective of department directors, unit managers, directorate managers, and heads of sections.

Table 16. Simple regression results – Effect of preparedness and prevention on BCM.

Dependent variables	Model summary	ANOVA (b)	Variables	Regression coefficients (a)
R = 0.754	R ² = 0.569	Regression df = 1	F = 210.967	Sig. F = 0.000
		Residual df = 160		
		Total df = 161		
Variables	B	t Value	Sig. t	95% CI for B
Constant	1.597	8.956	0.000	–
Preparedness & Prevention	0.631	14.525	0.000	(0.546 – 0.716)

Note: a: Independent variable = Preparedness & Prevention
b: Dependent variable = Business Continuity Management (Combined dimensions)

Table 16 shows that the correlation coefficient (R) between Preparedness & Prevention and BCM was 0.754, reflecting a strong positive relationship. The coefficient of determination (R²) was 0.569, indicating that this dimension explains 56.9% of the variance in BCM. The F-value was 210.967 with Sig. = 0.000 < 0.05, confirming model significance. The regression coefficient (B = 0.631, t = 14.525, Sig. = 0.000) is statistically significant, and the

95% confidence interval for $B = (0.546 - 0.716)$, confirming robustness. Thus, the null hypothesis is rejected, and the alternative is accepted: Preparedness and Prevention significantly and positively affect BCM.

H_{01.3}: There is no statistically significant effect at the level of significance ($\alpha \leq 0.05$) of containment on Business Continuity Management dimensions combined in the Jordanian Ministry of Education.

Table 17. Simple regression results – Effect of containment on BCM.

Dependent variables	Model summary	ANOVA (b)	Variables	Regression Coefficients (a)
R = 0.801	R ² = 0.642	Regression df = 1	F = 287.106	Sig. F = 0.000
		Residual df = 160		
		Total df = 161		
Variables	B	t Value	Sig. t	95% CI for B
Constant	1.114	6.142	0.000	–
Containment	0.730	16.944	0.000	(0.645 – 0.815)

Note: a: Independent variable = Containment.

b: Dependent variable = Business continuity management (Combined dimensions).

Table 17 shows that the correlation coefficient (R) between Containment and BCM was **0.801**, a strong positive relationship. The coefficient of determination (R²) is 0.642, indicating that containment explains 64.2% of the variance in BCM. The F-value is 287.106 (Sig = 0.000 < 0.05), confirming the model's statistical significance. The regression coefficient (B = 0.730, t = 16.944, Sig = 0.000) is highly significant, and the 95% confidence interval for B is (0.645 – 0.815), confirming robustness. Therefore, the null hypothesis is rejected. Containment significantly and positively affects BCM.

H_{01.4}: There is no statistically significant effect at the level of significance ($\alpha \leq 0.05$) of Recovery on Business Continuity Management dimensions combined in the Jordanian Ministry of Education.

Table 18. Simple regression results – Effect of recovery on BCM.

Dependent variables	Model summary	ANOVA (b)	Variables	Regression Coefficients (a)
R = 0.835	R ² = 0.697	Regression df = 1	F = 367.495	Sig. F = 0.000
		Residual df = 160		
		Total df = 161		
Variables	B	t Value	Sig. t	95% CI for B
Constant	0.464	2.395	0.018	–
Recovery	0.877	19.170	0.000	(0.786 – 0.968)

Note: a: Independent variable = Recovery

b: Dependent variable = Business Continuity Management (combined dimensions)

Table 18 shows that the correlation coefficient (R) between Recovery and BCM was 0.835, the strongest among all dimensions. The coefficient of determination (R²) was 0.697, indicating that Recovery explains 69.7% of the variance in BCM. The F-value was 367.495 (Sig. = 0.000 < 0.05), confirming the model's statistical significance. The regression coefficient (B = 0.877, t = 19.170, Sig. = 0.000) is highly significant, and the 95% confidence interval for B = (0.786 – 0.968), confirming robustness. Therefore, the null hypothesis is rejected. Recovery is the most influential dimension, significantly and positively affecting BCM. Table 19 summarizes the results of testing the sub-hypotheses (Ho1.1–Ho1.4). All four crisis management dimensions significantly and positively influence business continuity management, as indicated by strong R values (0.740–0.835) and significant t values at the 0.01 level. Recovery demonstrates the strongest explanatory power (R² = 0.697), followed by Containment (0.642), Preparedness and Prevention (0.569), and Early Warning Detection (0.547). Since all 95% confidence intervals exclude zero, the robustness of these results is confirmed, leading to the rejection of all four sub-hypotheses.

Table 19. Summary of sub-hypotheses testing results (Ho1.1 – Ho1.4).

Sub-Hypothesis	Dimension	R	R ²	B	t Value	Sig. t	95% CI for B	Decision
Ho1.1	Early warning detection	0.740	0.547	0.768	13.909	0.000	(0.659 – 0.877)	Rejected
Ho1.2	Preparedness & prevention	0.754	0.569	0.631	14.525	0.000	(0.546 – 0.716)	Rejected
Ho1.3	Containment	0.801	0.642	0.730	16.944	0.000	(0.645 – 0.815)	Rejected
Ho1.4	Recovery	0.835	0.697	0.877	19.170	0.000	(0.786 – 0.968)	Rejected

All four sub-hypotheses (Ho1.1 – Ho1.4) were rejected. Each dimension of crisis management significantly and positively impacts Business Continuity Management. Recovery showed the strongest influence ($R^2 = 0.697$), followed by Containment (0.642), Preparedness & Prevention (0.569), and Early Warning Detection (0.547). All 95% confidence intervals exclude zero, confirming the statistical robustness of the results.

5. RESULTS AND RECOMMENDATIONS

5.1. Discussion of the Results

This study aimed to explore the impact of the availability of crisis management components on business continuity management at the Jordanian Ministry of Education, from the perspectives of various administrative roles, including department directors, unit managers, directorate managers, and heads of departments. The main findings are discussed as follows:

5.2. Results of the Study Questions: Relative Importance of Study Variables

The results showed that the level of crisis management components was high, with a total mean of 4.12 and a standard deviation of 0.580. The dimension “Recovery” ranked first with a mean of 4.20, followed by “Containment” (4.15), “Early Warning Signal Detection” (4.11), and “Preparedness and Prevention” (4.03). These findings indicate a strong acknowledgment by the respondents of the importance of implementing the various dimensions of crisis management within the ministry. It also reflects a high level of administrative awareness and institutional commitment to proactive crisis response strategies.

The results also revealed a high level of BCM with a total mean of 4.14 and a standard deviation of 0.626. Business Impact Analysis ranked highest among the dimensions at 4.19, followed by Risk Assessment at 4.15, Administrative Support at 4.13, and Awareness and Training at 4.10. These results demonstrate a strategic orientation among the Ministry’s administrative staff toward implementing comprehensive business continuity practices.

5.3. Results of the Hypotheses Testing

5.3.1. Main Hypothesis (H0.1)

The results of the multiple linear regression analysis confirmed a statistically significant effect (at $\alpha \leq 0.05$) of the crisis management dimensions (early warning signal detection, preparedness and prevention, containment, and recovery) on BCM dimensions (administrative support, risk assessment, business impact analysis, and awareness and training). The coefficient of determination was ($R^2 = 0.803$), indicating that crisis management practices explain 80.3% of the variance in BCM. These findings align with Al-Barouni (2021), which confirmed a significant impact of business continuity on effective crisis management, and Alsmeiat (2015), which highlighted the role of business continuity in mitigating risks during various phases of crises and disasters.

5.3.2. Sub-Hypotheses Results

Early Warning Signal Detection: There was a statistically significant impact of this dimension on business continuity, with $R^2 = 0.547$. This finding is consistent with Alsmeiat's (2015) study, which indicated a positive relationship between early warning capabilities and continuity planning.

Preparedness and Prevention: This dimension showed a significant effect on business continuity, with $R^2 = 0.569$. These findings agree with those of Alsmeiat (2015), who emphasized the role of proactive readiness in enhancing institutional resilience.

Containment: This dimension had a strong impact on business continuity, with $R^2 = 0.642$. This is in line with the study by Al Ameri and Musa (2021), which demonstrated a positive and significant relationship between containment mechanisms and improved public sector performance.

Recovery: This dimension had the strongest effect, with $R^2 = 0.697$. It highlights the importance of having effective recovery plans to resume operations swiftly after crises. These findings are consistent with Abuzyead and Sherif (2017), which showed a statistically significant relationship between recovery and business continuity in the context of Palestinian joint security operations.

5.4. Recommendations

Based on the regression results and their practical implications, the following recommendations are proposed:

- Since *Recovery* had the strongest impact on BCM, it is essential to prioritize post-crisis restoration mechanisms.
- 1. Establish a Specialized Crisis Impact and Recovery Team: A dedicated team should be responsible for evaluating the consequences of crises and managing the recovery process, including restoring operations and supporting affected units.
- 2. Develop recovery protocols and simulation exercises: Regular scenario-based training should be organized to test recovery plans and strengthen institutional readiness.
- Given the significant influence of *Containment*, immediate damage-control measures must be institutionalized:
- 3. Develop and Update a Crisis Containment Manual: The Ministry should create a structured manual documenting rapid-response protocols for diverse crisis scenarios.
- 4. Maintain a Continuously Updated Electronic Database: A digital system should be established to support containment decisions by providing timely data on resources, personnel, and risks.
- The statistical significance of *Preparedness & Prevention* highlights the importance of proactive planning:
- 5. Conduct Systematic Simulation Drills: Routine drills and workshops should be conducted across all administrative units to evaluate preparedness levels.
- 6. Create a comprehensive risk and crisis manual: this guide should outline potential risks, prevention strategies, and scenario-based response models tailored for the education sector.
- Although *Early Warning* ranked lowest, it still explained more than half of the BCM variance, underscoring its importance:
- 7. Invest in Early Warning and Monitoring Systems: Deploy electronic surveillance and monitoring systems to detect early signals of crises.
- 8. Enhance Interagency Coordination: Collaborate with entities such as civil defense, police, and health authorities to ensure rapid information exchange and early alerts.
- Since crisis management components collectively explained 80.3% of BCM variance, several overarching actions are also necessary:
- 9. Implement Comprehensive Training Programs: Develop awareness and capacity-building initiatives across all levels of staff to strengthen a culture of preparedness and continuity.
- 10. Promote Crisis Management Culture Among Educational Leaders: Provide leadership training, seminars, and manuals tailored for decision-makers to institutionalize resilience thinking within governance.
- 11. Encourage further research: Expand research to include the perspectives of school principals, teachers, and operational staff for a holistic understanding of crisis resilience.

6. CONCLUSION

This study investigated the impact of crisis management components on Business Continuity Management (BCM) within the Jordanian Ministry of Education. Drawing on the perspectives of key administrative personnel, the findings underscored the significant role that proactive crisis management practices play in enhancing institutional resilience and operational sustainability. The study revealed a high level of implementation across both crisis management and BCM dimensions, with “Recovery” and “Business Impact Analysis” ranking highest, respectively. Moreover, the results of multiple regression analyses confirmed that each crisis management dimension had a statistically significant and positive influence on the Ministry’s capacity to maintain educational operations during crises.

These outcomes highlight the Ministry's awareness of the necessity for comprehensive planning, early detection, risk mitigation, and structured recovery frameworks. The evidence presented affirms that effective crisis management is not merely a reactive measure but a critical enabler of continuity, stability, and long-term performance in the education sector. In light of these findings, the study concludes that integrating strategic crisis management frameworks and cultivating a robust culture of preparedness are indispensable for sustaining education during turbulent times. Future improvements should focus on institutionalizing crisis response protocols, fostering inter-agency collaboration, and embedding continuity principles within leadership development and administrative training programs.

The conclusions reached in this study offer a foundational reference for decision-makers and researchers seeking to advance crisis resilience in educational institutions, both in Jordan and beyond.

The statistical findings of this study provide clear guidance for shaping targeted policy interventions. For instance, the regression results showed that Recovery had the strongest effect on BCM ($B = 0.877$, $R^2 = 0.697$, CI $[0.786-0.968]$), emphasizing that robust post-crisis restoration mechanisms are the most decisive factor for sustaining educational operations. This directly justifies the recommendation to establish a specialized Crisis Impact and Recovery Team and to prioritize investments in recovery protocols. Similarly, Containment ($B = 0.730$, $R^2 = 0.642$, CI $[0.645-0.815]$) proved to be a significant predictor, highlighting the necessity of immediate response mechanisms during crises. This finding informs the recommendation to develop continuously updated containment plans and rapid-response databases to isolate crisis impacts effectively.

The effect of Preparedness and Prevention ($B = 0.631$, $R^2 = 0.569$, CI $[0.546-0.716]$) points to the importance of anticipatory planning, thereby supporting policy actions such as conducting simulation exercises and creating a comprehensive risk and crisis manual. Finally, although Early Warning Detection ($B = 0.768$, $R^2 = 0.547$, CI $[0.659-0.877]$) ranked lowest among the predictors, it still explained more than half of the variance in BCM, confirming its critical role. This result validates the recommendation to invest in early warning systems and electronic databases that enhance monitoring and proactive decision-making.

Taken together, these results provide a solid empirical foundation for the proposed recommendations, ensuring that each policy action is directly rooted in statistically significant findings.

6.1. Theoretical Contribution/Implications

This study contributes to the existing body of knowledge by empirically validating the conceptual relationship between crisis management and BCM within public sector institutions, specifically in the educational context. The findings reinforce the theoretical proposition that the dimensions of crisis management forecasting and detection, preparedness and prevention, containment, and recovery are not isolated administrative actions but interconnected processes that directly influence institutional resilience (Zuhri & Ahmed, 2022). By incorporating crisis management into strategic planning, this study also aligns with theories of organizational adaptability and systems resilience, offering a framework for future academic inquiry into crisis-resilient governance in the public sector (Sewify, 2021).

6.2. Practical Contribution/Implications

The research offers practical guidance for decision-makers and practitioners within the Ministry of Education and similar institutions. The results demonstrate the need for (Al-Suhimat et al., 2025; Alghafary, Diabat, & Abuhawileh, 2021):

- Investing in early warning and detection systems to anticipate risks.
- Designing and routinely updating preparedness and containment plans.
- Emphasizing the recovery phase to ensure post-crisis operational restoration.
- Allocating resources toward awareness programs and training initiatives.

These implications provide a roadmap for institutional leaders aiming to strengthen their crisis readiness and safeguard the continuity of educational services. Additionally, the study supports the establishment of specialized crisis management units and encourages collaboration with external agencies to enhance national educational resilience.

6.3. Limitations of the Study

While this study provides valuable insights into the relationship between crisis management components and BCM within the Jordanian Ministry of Education, several limitations must be acknowledged to contextualize the findings:

1. **Subject Boundaries:** The study focuses solely on the components of crisis management (early warning signal detection, preparedness and prevention, containment, and recovery) and their impact on BCM dimensions (administrative support, risk assessment, business impact analysis, and awareness and training). Other related organizational variables were not examined.
2. **Spatial Boundaries:** The research was geographically limited to the Ministry of Education in Jordan, which may restrict the applicability of the results to other governmental or private institutions within Jordan or in different national contexts.
3. **Human Boundaries:** The sample was limited to supervisory-level administrators namely, unit directors, department heads, directorate heads, and section supervisors. The perspectives of other stakeholder groups, such as teachers, operational staff, or students, were not included.
4. **Time Boundaries:** The data collection and analysis were conducted during the second semester of the 2023–2024 academic year. As such, the study reflects the specific organizational and contextual dynamics present during that period, and findings may evolve over time.

These limitations suggest that, while the results are meaningful within the defined context, future research should consider broader populations, additional institutional variables, and multiple methodological approaches to deepen and generalize the findings.

6.4. Contribution to the Literature

Beyond its theoretical and practical implications, this study makes a meaningful contribution to the literature by providing empirical evidence from the Jordanian public education sector an area that has received limited scholarly attention in crisis and continuity research. By quantitatively demonstrating the positive and significant impact of crisis management components on BCM, the study extends prior regional and international findings (e.g., (Al-Barouni, 2021; Chen & Xu, 2023; Sadrabadi et al., 2024)) to the specific context of a national ministry.

This contribution enriches the global discourse on crisis-resilient governance and underscores the importance of embedding crisis management within the strategic fabric of public institutions, particularly in education. It also provides a foundation for comparative studies across countries and sectors, enabling scholars to refine models of crisis and continuity management for broader applicability.

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