Emergency Management in Universities as a Case Study Islamic University Gaza

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Abstract: The Islamic University of Gaza (IUG) is one of the higher education institutions that are highly concerned about saving lives and possessions through conscious management of the emergency. The study aims at analysing the risks at the university premises through identifying and evaluating these risks as well as designing an assessment matrix of the dangers that threaten their educational activities. Moreover, it aims to upgrade the work of the safety committee responsible for directing operations at the university into a comprehensive emergency committee that incorporates all the vocational, technical and medical specializations. The study reveals that the risks threatening the (IUG) include fire, explosions, bombardment and mechanical dangers with fire maintaining the greatest likelihood. A proposal for an emergency committee which tackles the defects of the safety committee and which encompasses all states of emergency has been made. The responsibilities of the proposed emergency committee have been determined, so that, the tasks will be clear and specialized and Scenarios have been prepared for possible risks in the facilities of the Islamic University. The study recommends that the frame for the proposed emergency committee should be established and that the responsibilities of each subcommittee be identified. In addition, it recommends that a clear description of each potential danger be provided.

INTRODUCTION

Colleges and universities all over the world work to promote programs that curtail disasters effects on their educational activities, lives and possessions within a number of measures for emergency management. It includes a group of effective basic elements to curb the consequences of dangers such as establishing readiness and effective response procedures.

These elements of the comprehensive emergency plans also include operations management, emergency information management, leadership reinforcement, social partnerships, training programs for workers and students, policy and strategy development and program promotions to curtail the risks and maintain safety and security on campus[1, 2].

Within their measures to reduce risks, universities work to enhance legislations and set guiding principles related to practices of chemical security and specialized in safety and security standards applied at chemistry and medicine labs[3].

In addition, they work on formulating a science-based strategy for the disposal of dangerous waste resulting from science and chemistry labs at universities. This waste is usually disposed of haphazardly.

All these measures require a declared follow-up and surveillance system to maintain constant improvement, in addition to learning from previous risks and incidents[4].

Emergency committee trained to deal with the risks before and while happening as well as improving team capabilities based on regional, national and continental requirements are prerequisites for the success of emergency management[5].

Training in the response to emergencies presents some problems, notably the lack of developing effective strategies for teamwork in the light of conditions that hinder preservation and generalization: there is a difference between training and field proceedings during disasters[6].

Islamic university strives to be an institution capable of facing disasters and evaluating dangers that threaten its activities and put lives and properties at risk.

It works to assign responsibilities of emergency committee members. Several disasters and dangers threaten education in Gaza and directly affect it. Thus, education in Gaza is labeled as "emergency education". Emergency education can help in:

- Creating a feeling of normal life for students after crises
- Restoring hope of life through the continuity of the education process
- Reinforcing psychological recovery from distressing experiences through social and psychological activities

For that, the University and the emergency management unit must help increase resilience amongst students and subsequently decrease vulnerability to disasters by assisting students in becoming better prepared to deal with emergencies[7].

MATERIALS AND METHODS

Researchers have adopted both the analytic and descriptive approaches to answering the study inquiries. They have sought help through interviews with officials in the safety and security committee at Islamic University to identify the risks that threaten the university and determine capabilities and resources available.

Study problem: The study aims at identifying the dangers that threaten the Islamic University premises, working to develop an emergency committee and determine its responsibilities and designing an assessment matrix of the dangers that threaten educational activities, considering the possibility of controlling each danger. The Islamic University of Gaza is the biggest university in Gaza Strip, it has been chosen as a case study.

Study objectives:
- Identifying the dangers that threaten educational premises at Islamic University
- Evaluating the dangers that threaten education premises at Islamic University
- Assigning responsibilities of each subcommittee in the emergency committee
- Prepare scenarios for the emergency event of the Islamic University
- Prepare procedures for responding to the emergency event of the Islamic University

Study area: The Islamic University of Gaza is one of Palestine's higher education institutions, operating under the Ministry of Education and Higher Education supervision. It's a member of many international leagues and unions such as the Arab Universities Union, Islamic Universities Union, Islamic Universities League, Mediterranean Universities League and International Association of Universities. The university also incorporates a number of administrative councils under its supervision, notably the Board of Trustees and University Council.

The university provides students with an education that is compliant with Islamic values and Palestinian traditions. It is also concerned with the practical aspect as well as the theoretical aspect. In addition, the university grants BSc, MSc and PhD, in education and science majors within 11 colleges it comprises. Figure 1 shows the general location of the university: buildings, workshops and science labs.
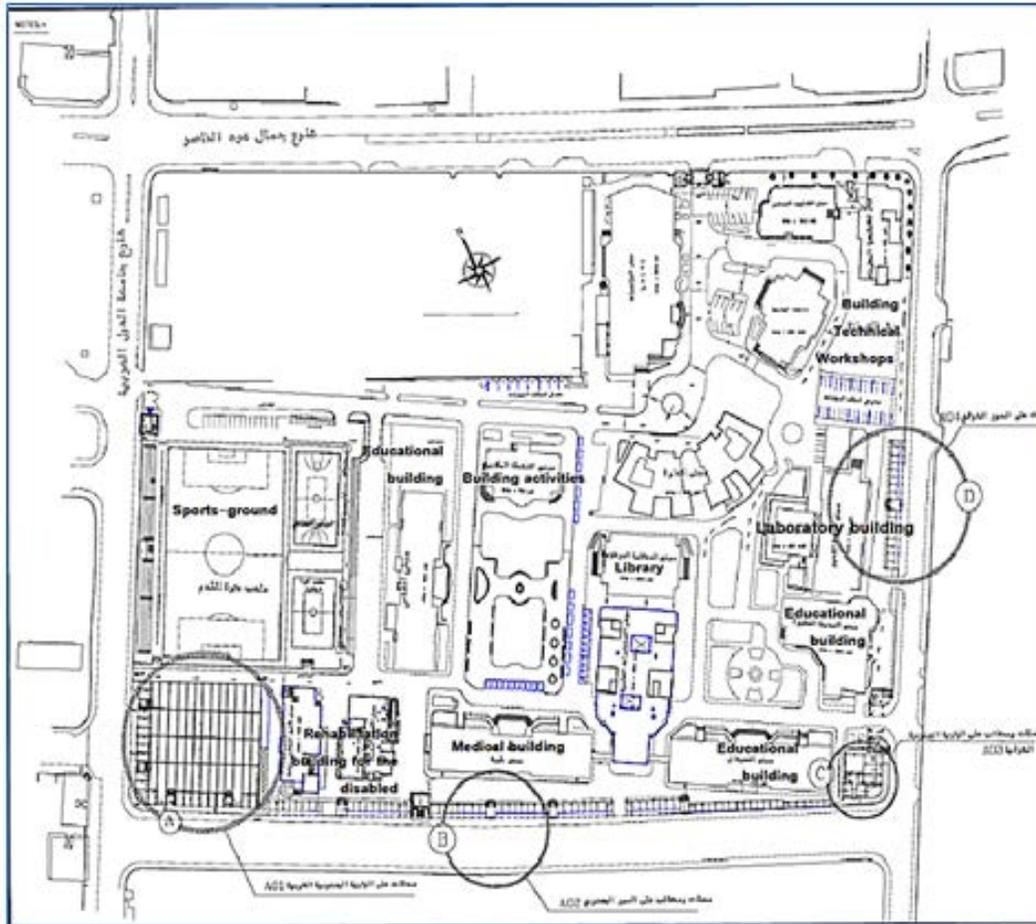
Fig. 1: IUG general location

RESULTS AND DISCUSSION

Researchers interviewed safety and security committee officials at the university. Then they evaluated the risks through designing a matrix of the risks threatening IUG premises.

Risk identification: Requirements of emergency management include a set of integral and comprehensive procedures for directing emergency operations at times of emergencies that may pose a threat to people's lives. This can be approached through analysing and evaluating the risks threatening the community or institution as well as identifying the possibilities of setting scenarios to save lives and protect properties[8].

Risks the university is exposed to have been identified through analysing results of interviews with officials; these results helped evaluation of the risks likelihood and the range of each danger as well as identifying the predicted effects on individuals and properties. The results also helped in designing risks matrix that will contribute to setting procedures for curtailing these risks. Table 1 shows the risks IUG is exposed to and the classification of the threats.

Evaluation of the risks threatening the university requires an assessment of their consequences and likelihood. Then the risks matrix is designed.

Based on the methodology illustrated in Table 2, the risks assessment matrix can be designed through identifying consequences and the likelihood of the risks.

Risk analysis: Based on the methodology illustrated in Table 2, the impact of risks on individuals and properties can be identified as shown in Table 3.

Based on the methodology illustrated in Table 2, risks likelihood and recurrence in the past years can be shown in Table 4.

Risks assessment matrix: Table 5 shows the matrix of risks threatening IUG, including consequences and likelihood of each threat and the overall value as well as risk assessment of each threat.

Safety committee: There is no emergency committee in the university but there is a safety committee formed in 2014 with the purpose of observing the execution of safety regulations at labs and engineering workshops. It introduces recommendations to the assistant director to do what is necessary for saving lives and protecting properties. It was formed under supervision of the assistant vice president for administrative affairs with membership of the following:

- Engineering office director: vice president of the committee
- Quality and development staff member
- Science college official

Table 1: Risks threatening IUG

Threat	Threat code	Threats classification	
		Natural	Man-made
Bombardment	T1	Man-made	
Fire	T2	Man-made	
Mechanical hazards	T3	Man-made	
Explosions	T4	Man-made	
Human errors	T5	Man-made	

Table 2: Methodology of designing risks assessment matrix

Assessment matrix	Consequence				
	Minor	Low	Moderate	High	Catastrophic
Likelihood	1	3	5	8	10
Extreme = 5	5	15	25	40	50
V. High = 4	4	12	20	32	40
High = 3	3	9	15	24	30
Medium = 1	2	6	10	16	20
Low = 1	1	3	5	8	10

Table 3: Risks effects on individuals and properties

Threat	Threat code	Average effect	Evaluation
Bombardment	T1	10	Catastrophic
Fire	T2	8	Major
Mechanical hazards	T3	5	Moderate
Explosions	T4	8	Major
Human errors	T5	3	Minor

- Engineering college official
- Campus services staff member
- Manager of engineering office maintenance unit

The maintenance unit at IUG is regarded as the executive sector for inspection and observation of precautionary measures. It is also responsible for putting recommendations introduced by safety committee into practice through the following:

- Holding safety training courses for students and staff members
- Evacuation drills for some colleges in the university
- Equipping university premises with fire extinguishers
- Regular examination of safety measures at labs and workshops and submission of the recommendation to the assistant director
- Holding workshops for raising students and staff members' awareness of precautionary measures
- Providing instruction posters at labs and workshops for protection from hazards

Suggestion of a committee for emergency management in the university: Forming emergency teams and assigning their responsibilities is a conclusive step in planning for emergency response. If the emergency response team doesn't recognize their roles and responsibilities before the occurrence of disasters, it may lead to failure in executing response measures and more deaths[9].

Based on the results of interviews with safety committee members, it is obvious that there was no emergency committee and the safety committee had specific tasks. Therefore, Fig. 2 shows the proposal for an emergency committee with the purpose of compensating for defect flaws in the safety and security committee and it includes all states of emergency, according to researchers.

Table 4: Likelihood of risks threatening IUG

Threat	Threat code	Likelihood				
		(5) Ex	(4) V.H	(3) H	(2) M	(1) Low
Bombardment	T1	5	-	-	-	-
Fire	T2	5	-	-	-	-
Mechanical hazards	T3	-	4	-	-	-
Explosions	T4	-	4	-	-	-
Human errors	T5	-	-	3	-	-

Table 5: Matrix of risks threatening IUG

Threats	Threat code	Likelihood	Consequence	Overall risk value	Risk assessment	Prioritization
Bombardment	T1	5	10	50	Extreme	T1
Fire	T2	5	8	40	Extreme	T2
Mechanical hazards	T3	4	5	20	Moderate	T4
Explosions	T4	4	8	32	High	T3
Human errors	T5	3	3	9	Minor	T5

The following are requirements for the committee to work effectively:

- Identifying committees respective tasks and responsibilities to avoid overlap in validities
- Forming specialized teams in each committee
- Providing committee members with essential training
- Providing essential requirements for each committee
- Allocating emergency budget within the university budget
- Setting procedures for preparedness and response to any possible emergency in the university
- Prepare scenarios for the possible occurrence of risks in the Islamic University based on previous experience

- Prepare procedures for responding to the rapid intervention of emergency committees
- Prepare an administrative form for work for each of the tasks of the members of the emergency committee

Emergency committee responsibilities: Table 6 shows the tasks and responsibilities of an emergency management committee in order for the tasks to be clear and specific without interference in validities.

Emergency management scenarios at the Islamic University: There are many potential emergencies that can occur at a university and it is difficult to identify all of them but the focus is usually on the most likely risks.
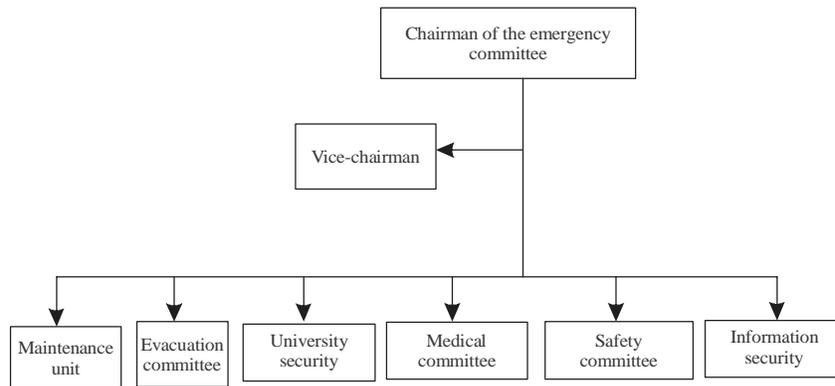

Fig. 2: Proposed emergency committee IUG

Table 6: Tasks and responsibilities of proposed emergency committee

Committee	Responsibilities
Safety committee	Protecting the university environment from threatening dangers
	Identifying international safety and security standards necessary for the university
	Holding safety-related training courses for students and staff members
	Equipping university premises with fire extinguishers
	Regular examination of safety measures at labs and workshops, and submission of recommendations to the assistant directors in terms of flaws in procedures
	Holding workshops and giving specialized scientific lectures on improving efficiency and performance in risk management
	Providing instruction signs at labs and workshops for risk prevention
	Setting procedures for preparedness and response to the risks threatening the university
	Enquiring into university incidents and identifying the causes
	Documenting university incidents into a private record and identifying lessons learned
	Issuing instructions and directives for all university departments before, during and after the occurrence of different risks
	Monitoring violations of safety and security and submitting. recommendations to the senior management to avoid risks
Maintenance unit	Executing recommendations produced by the safety and security committee
	Checking and maintaining fire-suppression systems at the premises
	Checking and maintaining elevators at the premises
	Checking and maintaining electricity networks
	Regular examination of central gas networks at science labs buildings
	Studying building maps before construction to ascertain whether safety and security requirements are available in buildings, labs and workshops
Evacuation committee	Carrying out partial and total evacuation maneuvers of university premises
	Holding evacuation-related training courses for students and staff members in coordination with civil defence
	Setting partial and total evacuation plans
	Assuring readiness of emergency exits in the university buildings
	Identifying hot spots and surrounding them with warning signs
	Identifying safe zones for incident management by specialists

Table 6: Continue

Committee	Responsibilities
	Specifying gathering positions for each building, away from danger
	Circulating signs to raise students' awareness of building evacuation strategies
	Producing diagrams illustrating building and safety exits
	Evacuating students from university premises in case of danger, in coordination with university security
	Securing the university gates and the roads leading to it in coordination with university security, in order to facilitate movement during the evacuation
	Information security committee
	Storing back-up copies of the important files and updating them daily
	Protecting university information security via appropriate security programs
	Assuring the effectiveness of security programs in the university premises
	Preventing university network hacking and protecting data against piracy
	Providing CCTVs at the university premises and dangerous places
	Providing danger-sensing systems at labs, engineering workshops, and stores of flammable and dangerous materials
	Issuing instructions to raise staff members' awareness of securing their data against hacking
	Regular evaluation of dangerous electronics-related incidents to learn lessons
Medical committee	Providing necessary medical equipment and medicine during agencies
	Holding first aid and emergency medicine training courses for students and staff members
	Documenting and classifying casualties and underlying causes
	Communicating and coordinating with the Red Crescent Society and Ministry of Health at times of emergency
	Raising students' and staff members' prevention awareness
University security	Providing emergency committee and security staff in the university with proper means of communication
	Coordinating and working with the other emergency management committees to facilitate their work at states of emergency
	Saving lives and protecting equipment and properties of the university premises
	Maintaining order and preventing clashes and violence in the university premises
	Observing and guarding the university entrances, as well as the machinery and the premises
	Observing labs, workplaces, generators, etc... and informing the head of the emergency committee in case of noticing any potential danger
	Organizing student's and workers' entry during ceremonies and festivals
	Coordinating with the Ministry of interior in case of security-related incidents in the university
	Documenting daily observations into special daily observation records
	Securing all the university premises when there are large crowds and keeping them away from dangerous places
	Computerizing security-related measures, observing CCTVs and recording violations
	Submitting regular reports to the head of the emergency committee and producing observations in favor of progress and improvement

The effectiveness of emergency procedures depends on the effectiveness of emergency event scenarios within proper planning procedures and the ability to prepare well through training and maneuvers for members of the emergency committee as well as the ability of the emergency dumping to manage operations and make decisions and distribute tasks, responsibilities and powers accurately.

Emergency event scenarios are simulations of emergency response in the event of a hazard that depends on:

- Proper planning to avoid potential risks
- Quick information gathering at the time of the event
- The speed of making the right decisions
- Ability to carry out the primary task of the emergency committee which is to save the victims

Table 7 shows the emergency event scenarios at the Islamic University based on the assumptions of risk.

Response procedures: The Islamic University was bombed in the 2008 war and the 2014 war which caused many property losses. The Gaza sector is under constant threat of war, so, bombing is expected at any time to areas close to the university or its facilities which may endanger the lives of students and staff at risk.

Fire is also considered one of the most likely dangers in higher education institutions and the Islamic University also suffers from fire risks. Fires occur at university facilities[10]:

- Electrical circuits and switches
- Gas networks in laboratories and kitchens
- Machinery and electrical generators
- Flammable compounds (gas cylinders, paints and cleaning fluids, chemicals)
- Negligence and smoking

Mechanical hazards: arise from a collision between the worker's body and a solid body, such as the use of machinery and elevator malfunction. Damages caused by mechanical hazards[11]:

- Risks associated with mechanical operations such as shear, ground, emission and volatilization of hazardous materials from them
- Risks associated with the machine's balance such as the possibility of it running out or turning over
- Risks associated with operating systems such as injuries arising from manual handling when placing materials on the machine

Table 7: Scenarios the emergency event of the Islamic University

Risk	The level of risk "Green"	The level of risk "Yellow"	The level of risk "Red"
Bombardment	The normal situation in the work of the university	Military events are accelerating in the Gaza strip The bombing of areas close to the facilities of the Islamic University A meeting of the emergency committee to follow the development of events Close the university for one day or more Evacuating students and staff from university facilities Continued consultation between committee members to avoid the consequences Send reports of the disaster to senior management on developments at the university Maintaining the security and property of the university during security events	In the event that the university was bombed A declaration of a state of emergency in the university's facilities Close the university and work permits until further notice Activating response and intervention procedures for rescue, ambulance and evacuation Coordination with government aid and civil defense to overcome the consequences of the bombing Maintaining safe university properties during security events Send reports of the disaster to senior management on developments at the university
Fire hazard	The normal situation in the work of the university Periodically checking electrical networks, gas networks, chemical stores and fuel storage locations	Low warning of fire in a specific area of the university's facilities The emergency unit verifies the alarms and the ability to control it Partial activation of the emergency room to include the president, safety and security unit, medical and security committee Communicate and coordinate with the civil defense, if necessary The evacuation team works to evacuate students from the danger zone Submitting a report on the event to the Senior management emergency committee	A high warning of a fire in the university's facilities in chemical stores or gas networks the university Activation of the emergency room Activating rapid response and intervention procedures from rescue, ambulance and evacuation teams Closing the gas networks and disconnect the electrical current from the danger area Keeping flammable and explosive materials away from the danger zone Communication and coordination with the civil defense, the red crescent and the ministry of health Maintaining the university's security and properties during risk developments Sending reports of the disaster to senior management on developments at the university Taking advantage of the event to avoid recurrence at the administrative and technical levels
Explosions	The normal situation in the work of the university Periodically checking electrical networks, gas networks, chemical stores and fuel storage locations	Low warning of leaks in gas networks or short circuits in fuel depots or chemicals The emergency unit verifies the alarm and the ability to control it Partial activation of the emergency room to include the president, safety and security unit, security committee and evaluation committee Communicate and coordinate with the civil defense, if necessary The evacuation of students from the danger zone Send reports of the disaster to senior management on developments at the university Take advantage of the event to avoid recurrence at the administrative and technical levels	Warning of an explosion in the university's chemical stores Declaration of the state of emergency at the university Activation of the emergency room Activation of rapid response and intervention procedures from rescue, ambulance and evacuation teams Closing the gas networks and disconnect the electrical current from the danger area Keeping flammable and explosive materials away from the danger zone Communication and coordination with the civil defense, the red crescent and the ministry of health Maintaining the university's security and properties during risk developments Sending reports of the disaster to senior management on developments at the university Taking advantage of the event to avoid recurrence at the administrative and technical levels
Mechanical hazards	The normal situation in the work of the university Periodic maintenance work on elevators and machines in engineering workshops and technical workshops Review the preventive and	Low warning of a problem with an elevator in one of the university facilities or the occurrence of work injuries in the workshops The safety and security unit checks the alarm and the possibility of controlling it Partial activation of the emergency room to include the president, safety and security unit,	A high warning of the presence of elevators or work injuries from machines in engineering workshops Declaration of the state of emergency at the university Activating each of the university's emergency room

Table 7: Continue

	The level of risk		
Risk	The level of risk "Green"	The level of risk "Yellow"	The level of risk "Red"
	safety procedures in the university's mechanical and technical facilities Ongoing monitoring of students and staff to know their commitment to safety and security measures	security committee and medical committee The evacuation of students from the danger zone Working to assist the injured or transfer them to hospitals Communicate with the civil defense if necessary Maintaining the university's security and properties during risk developments Send reports of the disaster to senior management on developments at the university Take advantage of the event to avoid recurrence at the administrative and technical levels	The response and intervention procedures of the rescue, ambulance and evacuation teams are activated Communication and coordination with the civil defense, the red crescent and the ministry of health Maintaining the university's security and properties during risk developments Sending reports of the disaster to senior management on developments at the university Taking advantage of the event to avoid recurrence at the administrative and technical levels
Human errors	The normal situation in the work of the university Review the preventive and safety procedures in the university's mechanical and technical facilities Ongoing monitoring of students and staff to know their commitment to safety and security measures	Warning from the monitoring unit of the possibility of a problem or danger occurring in laboratories or engineering workshops Working to verify the warning and the possibility of controlling it Working on a technical treatment for the problem by the safety and security unit Doing what is necessary, so that, the danger does not recur Maintaining the university's security and properties during risk developments Sending reports of the disaster to senior management on developments at the university	A high warning of the presence of elevators or work injuries from machines in engineering workshops Declaration of the state of emergency at the university Activate each of the university's emergency room The response and intervention procedures of the rescue, ambulance and evacuation teams are activated Communication and coordination with the civil defense, the red crescent and the ministry of health Maintaining the university's security and properties during risk developments Send reports of the disaster to senior management on developments at the university Taking advantage of the event to avoid recurrence at the administrative and technical levels

Table 8: Procedures for responding to an emergency event at the Islamic University

Risks	Response procedures	The agency responsible for implementation	The level of risk Catastrophic/large/medium/low
Bombardment	Declaration a state of emergency	Chairman of the emergency committee	Catastrophic/large
	Activation the emergency room	Chairman of the emergency committee	Catastrophic/large
Fire hazard	Partial activation of the emergency room	Chairman of the emergency committee	Low
	Operating the alarm system in the university's facilities	University security	Catastrophic/large/medium/low
Explosions	Evacuating workers and students from university facilities	Evacuation committee	Catastrophic/large/medium/low
	Closing the gas and electricity networks	Safety committee	Catastrophic/large/medium/low
Mechanical dangers	Searching and rescue operations in the danger zone	Safety committee	Catastrophic/large/medium/low
	First aiding for injuries in the danger zone	Medical committee	Catastrophic/large/medium/low
Human errors	Communication and coordination with the civil defense and the red crescent	Assistant chairman of the emergency committee	Catastrophic/large
	Maintaining security and university property	University security	Catastrophic/large/medium/low
	Keeping flammable and combustible materials away from the danger zone	Safety committee	Catastrophic/large/medium/low
	Sending reports of the disaster to senior management on developments at the university	Chairman of the emergency committee	Catastrophic/large/medium/low

The effectiveness of emergency procedures depends on:

- Effectiveness of emergency response procedures
- The ability to prepare well through training and maneuvers for members of the emergency committee
- The ability of an emergency dumping room to manage operations, make decisions and distribute tasks, responsibilities

Table 8 presents the procedures of the emergency committee if the university is exposed to risks.

Emergency Room (ER): The purpose of the ER[12]:

- Command centre for the management of information
- Decision-making in critical situations
- Resource support allocation in an emergency

- Managing recovery operations after the disaster
- Sharing of this information with the senior management of the University and University President
- Providing "one voice" in communicating emergency information to students and staff

Results of the study: Through the study, researchers have reached the following conclusions:

- Fire, explosions, bombardment and mechanical dangers are part of the risks threatening the IUG, with the fire having the greatest likelihood
- Negligence and inexperience are human flaws that are most likely to pose a threat to the university premises
- There is no clear framework for the Islamic University emergency committee. However, there is a safety committee that doesn't include all colleges
- A proposal for emergency committee compensating for safety committee defects have been made and it includes all states of emergency
- Responsibilities of the proposed emergency management committee in the university have been assigned, so that, the tasks are clear and specific to avoid overlap in validities
- Risks threatening the IUG have been assessed through identifying the likelihood and consequences of each threat and designing an assessment matrix of these risks
- Scenarios have been prepared for a possible risk in the facilities of the Islamic University of Gaza
- Preparing procedures for responding to the emergency event of the Islamic University of Gaza

CONCLUSION

Based on the results of this study, researchers have offered several recommendations which once approved by the university senior management will help improve emergency management in the IUG premises. The following are the most important recommendations:

- Establishing a framework for the proposed emergency committee of this study and assigning each subcommittee respective responsibilities
- Assigning responsibilities of each subcommittee of the proposed emergency committee
- Taking corrective measures for safety and security and serious incidents
- Providing a detailed description of each potential security-related risk and how to address the risks to avoid them
- Providing students and staff members with an informative guide to raise their awareness of the dangers and threats in the university premises

- Paying further attention to staff members' training on reporting the fire, emergency as well as evacuating buildings in emergencies
- Allocating a purposeful budget for the improvement of safety and security and emergency management.
- Effective training on procedures for responding to potential risks at the Islamic University
- Preparing corrective actions based on feedback and experience gained from emergency accidents

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