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Evaluation of Chemical and Biological Safety and Security level at the University of Babylon Labs.

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Abstract

This investigation was designed to evaluate the level of chemical and biological safety and security in University of Babylon Labs by depending on 4 forms related with chemicals, Electricity, Fire safety and Security for labs with emphasis on Control of substances hazardous to health (COSSH) and Materials Safety Data Sheet(MSDS), these forms was applied for 79 labs, 121 labs, 119 labs, and 119 labs for form 1, 2,3, and 4 respectively, the highest ratio recorded with answer (no) for question 5 in form 1 , question 10 in form 2, question 17 in form 3, and question 27 in form 4, we concluded from this study that safety and security level in University of Babylon labs don't fit the standard requirements and need future plan for development the aspect of Safety and Security in all labs.

Keywords: Chemical, Biological, Safety, Security, University Labs.

Introduction

A perfect chemical, Biological safety& security program, like most other safety programs, comprises a combination of administrative, engineering, and personal protective equipment[1].

The rules and procedures predispose to chemical safety are implanted to prevent potentially harmful chemical exposure.

For the affectivity of these rules and procedures in University labs, it is so important to have very specific roles and responsibilities for lab staff which related with storage, use, and disposal of chemicals[2]

Evaluation of Chemical and Biological Safety and Security level depends on a Chemical, Laboratory, or Safety Committee, This committee have important task such as supply the expert instruments to the university, Reassessment of safety-related aspects of laboratory research [3]

In addition to that, the Department in University Colleges is responsible for approve that all lab personnel are efficient trained when working with chemicals , provide the good resources regarding safety and Security and ensure that all experiments in labs are strictly following the chemical Safety & Security instructions.[4]

The main aspect of Chemical and Biological Safety and Security level at the University is should follow the restricted instructions by adapt always in labs the following: Personal protective equipment (PPE), Eye protection, Respiratory protection, Hand protection, Hearing protection, Protective clothing, Foot protection, precautions Signs and labels, Labeling of chemicals, Reporting procedure, Emergency response to a chemical spill.[5]

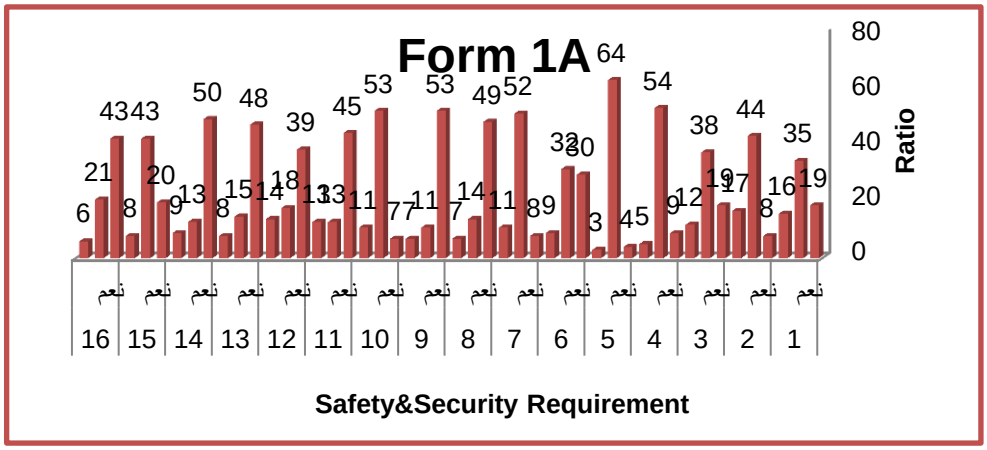
Materials & Methods

Four forms are used in this study which related with chemicals, Electricity, Fire safety and Security for labs with emphasis on Control of substances hazardous to health (COSSH) and Materials Safety Data Sheet (MSDS), these forms was applied for 79 labs, 121 labs, 119 labs, and 119 labs for form 1, 2,3, and 4 respectively(Figure 1), this questionnaire depends on [6,7,8].Al forms edited before distributed to all colleges in University of Babylon.

Figure 1: Chemical, Biological Safety & Security Evaluation forms.

Results & discussion

According to 4 forms related with chemicals, Electricity, Fire safety and Security for labs with emphasis on Control of substances hazardous to health (COSSH) and Materials Safety Data Sheet (MSDS), these forms was applied for 79 labs, 121 labs, 119 labs, and 119 labs for form 1, 2,3, and 4 respectively, the highest ratio recorded with answer (no) for question 5 in form 1



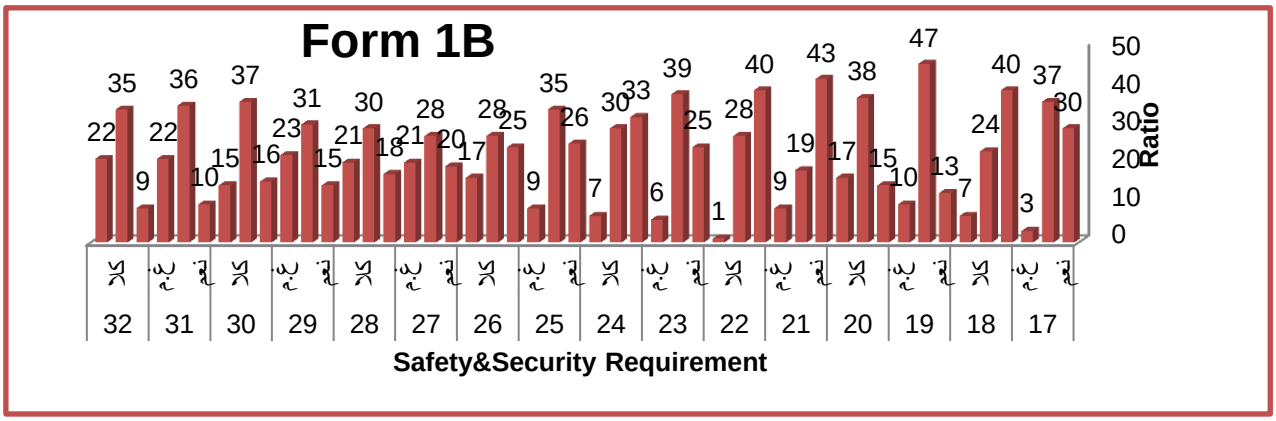
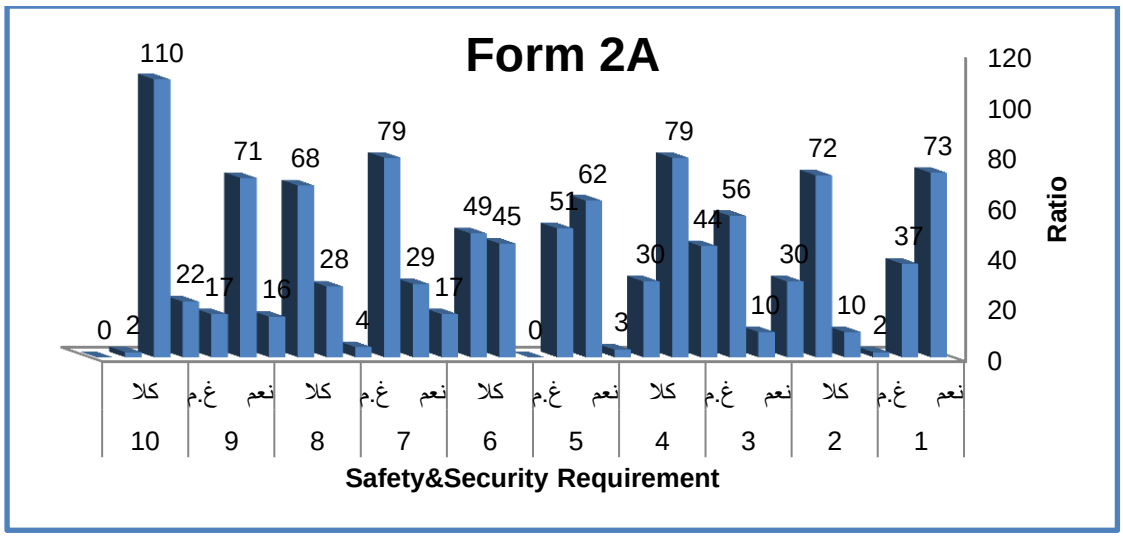


Figure 2: Chemical, Biological Safety & Security Evaluation For 79 labs.

The lacking of Controlling on the buying, distribution and storage of chemicals is lead to effect on the whole Chemical and Biological Safety Program[9]. the highest ratio recorded with answer (no) for question 10 in form 2 (Figure 3)



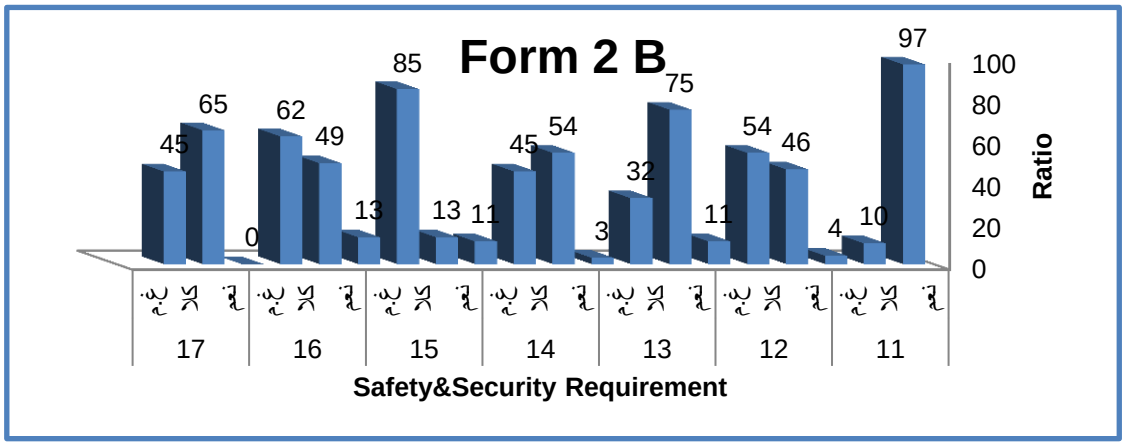
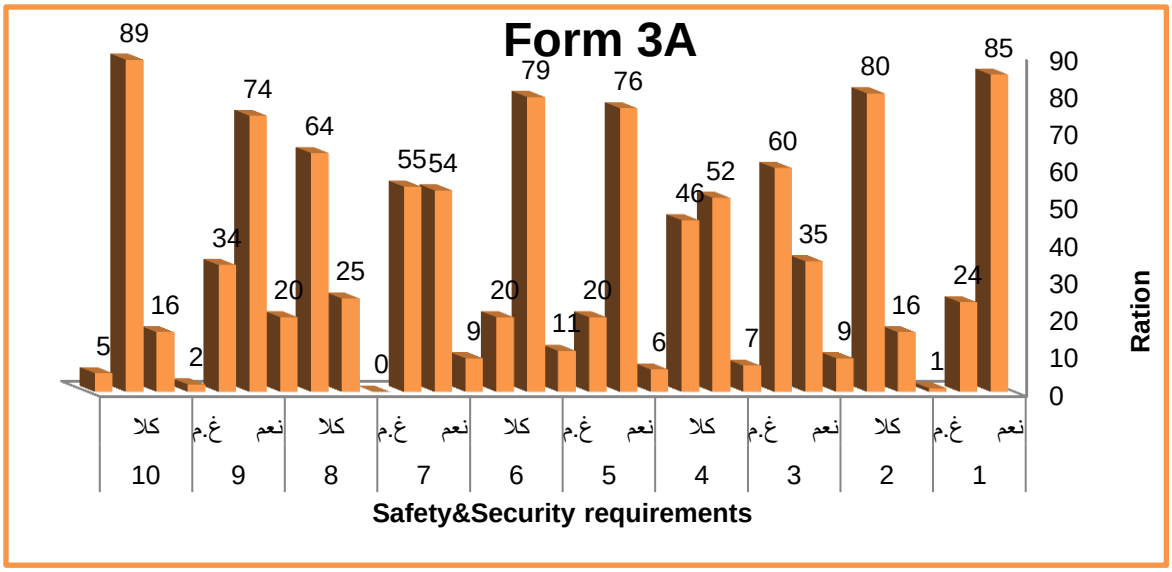


Figure 3: Chemical, Biological Safety&Security Evaluation For 121 labs.

The highest ratio recorded with answer (no) For question 17 in form 3, one of the evaluation principle is Risk assessment which needs precise decision[10]. (Figure 4).



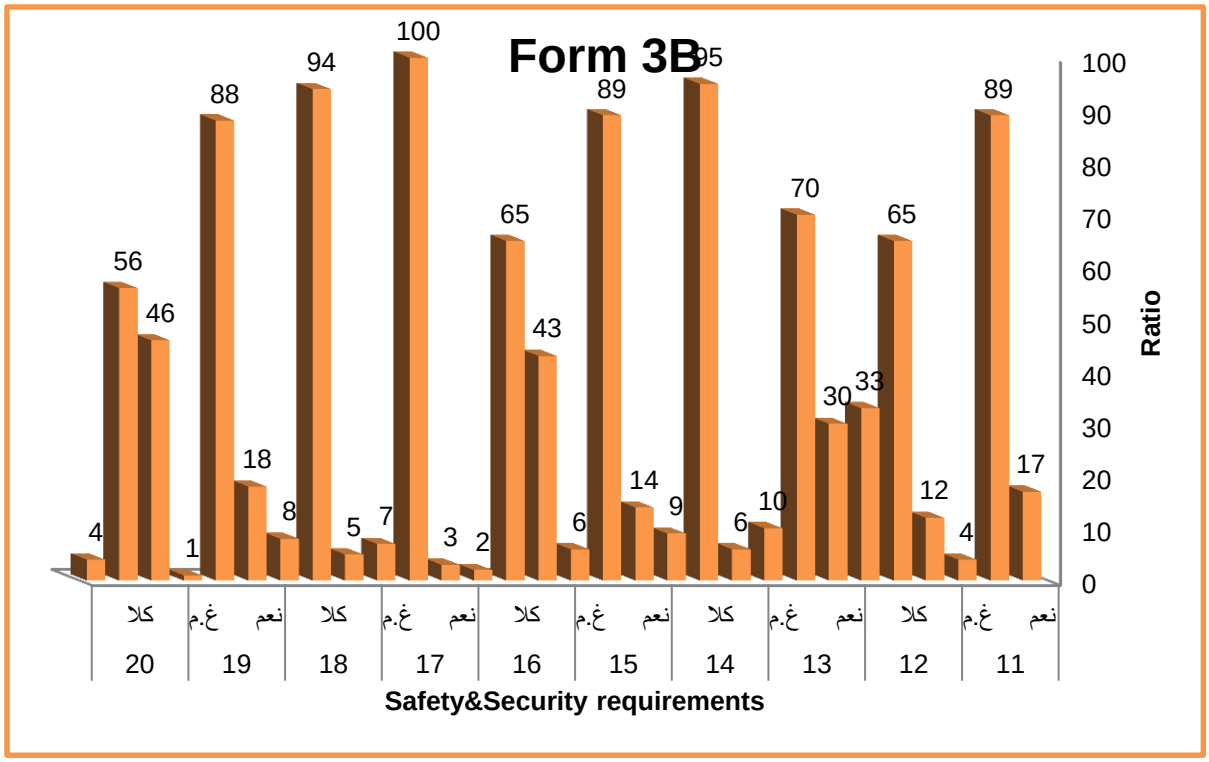


Figure 4: Chemical, Biological Safety&Security Evaluation For 119 labs.

One of the weakness in Safety and Security requirements is not to inform the students of the hazards and precautions which it's necessary in labs work and the students should participate in a discussion of safety and Security issues [11]. The highest ratio recorded with answer (no) for question 27 in form 4(Figure 5).

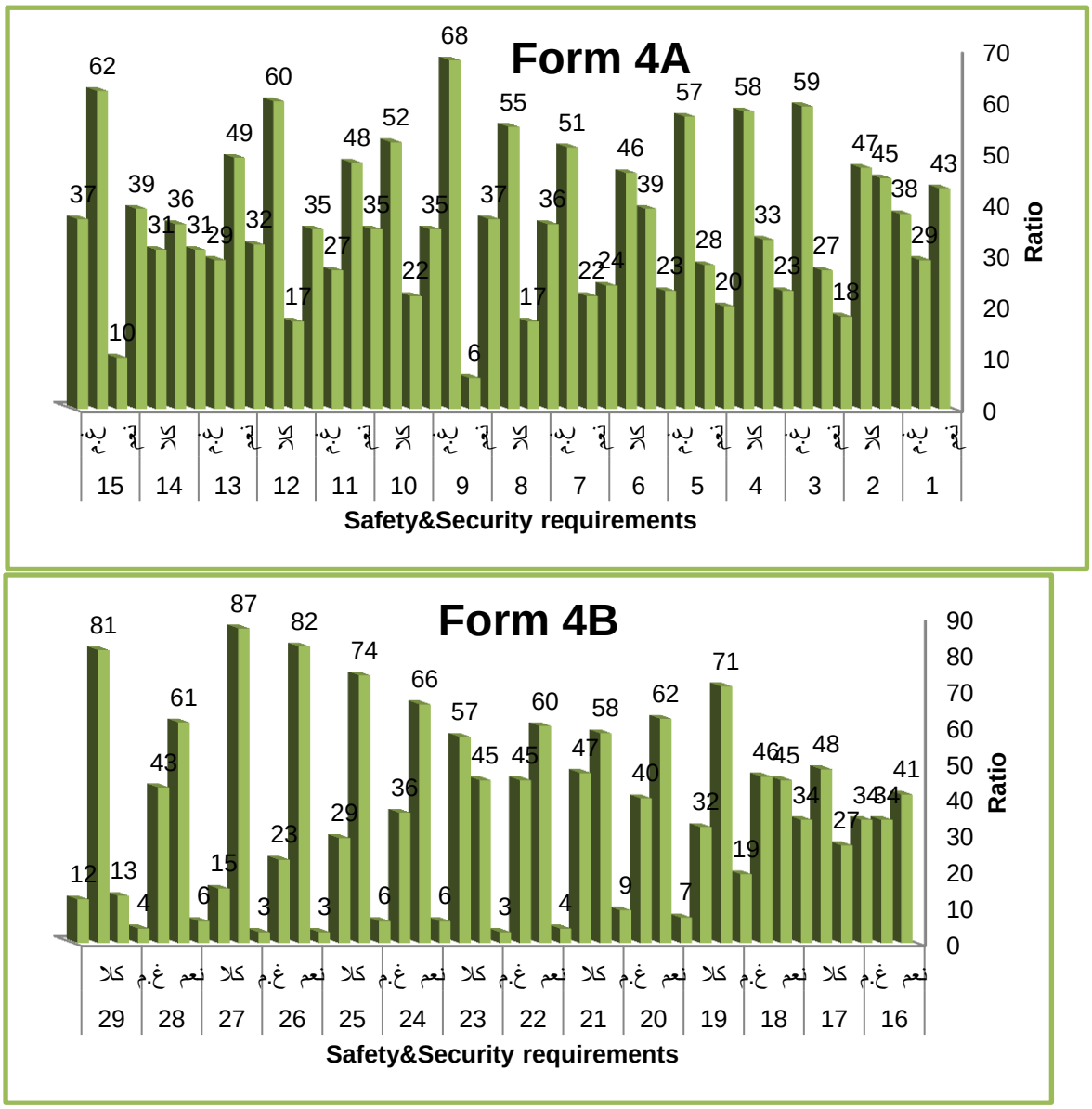


Figure 5: Chemical, Biological Safety&Security Evaluation For 119 labs.

Conclusions

We have concluded from this study that safety and security level in University of Babylon labs don't fit the standard requirements and need future plan for development the aspect of Safety and Security in all labs.

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References

1-APLU Council on Research Task Force on Laboratory Safety (2016). A Guide to Implementing a Safety Culture in Our Universities. CoR Paper 1. Washington, DC: Association of Public and Land-grant Universities.

2- American Chemical Society Committee on Chemical Safety (2012). Creating Safety Cultures in Academic Institutions. American Chemical Society, Washington, D.C., 2012: 34.

3- National Research Council (2014). Safe Science: Promoting a Culture of Safety in Academic Chemical Research. Washington, DC: The National Academies Press. Available at National Academies Press

4-National Research Council (2014). Safe Science: Actions for Deans and Vice Presidents for Research. Washington, DC: The National Academies Press. Available at National Academies.

5- Chemical Laboratory Safety and Security: A Guide to Developing Standard Operating Procedures (2001) Committee on Chemical Management Toolkit Expansion: Standard Operating Procedures; Board on Chemical Sciences and Technology; Division on Earth and Life Studies; National Academies of Sciences, Engineering, and Medicine, The National academic press, Washington,D.C.

6- WHO (2004) Laboratory biosafety manual, 3rd edition, Geneva.

7- Environmental Health & Safety (EHS)(2017) Biological Safety Manual,Michigan State University.

8- American chemical Society(2016) Guidelines for Chemical Laboratory Safety in Academic Institutions, Washington, DC 20036.

9- Safe Science: Promoting a Culture of Safety in Academic Chemical Research(2001) Committee on Establishing and Promoting a Culture of Safety in Academic Laboratory Research; Board on Chemical Sciences and Technology; Division on Earth and Life Studies; Board on Human-Systems Integration; Division of Behavioral and Social Sciences , The National academic press, Washington,D.C.

10- U.S. Department of Health and Human Services(2009) Biosafety in Microbiological and Biomedical Laboratories 5thedition. HHS Publication No. (CDC) 21-1112.U.S.

11- American Chemical Society(2001) Chemical Safety for Teachers and Their Supervisors, Washington, DC,U.S