

## AWARENESS AND ATTITUDE TOWARDS BASIC LIFE SUPPORT (BLS) AMONG STUDENTS AT MAJMMAH UNIVERSITY: STATISTICAL STUDY

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### ABSTRACT

A statistical study was performed to evaluate and analyze the awareness of the students at Majmmah university about the basic life support (BLS). A questionnaire model of 20 questions covering the basic points of the subject was distributed over the students, and 3 questions covering the attitudes of the students. A total number of 219 students including 13% internship, 37% clinical phase and 50% basic science academic students was participated in this cross-section study. The responses of the students have been collected and analyzed using the appropriate statistical methods. It has been shown that the

internship students have the maximum awareness about the BLS in comparison of the other students. More than 60% of those students could give the correct answers of the questionnaire model questions. While, the clinical phase and basic science students have the lowest awareness about the BLS. Only 28% and 25% of the clinical phase and basic students, respectively, could give the correct answer of the questionnaire model. It has been also shown that question number 12, 8, and 10 were the most difficult questions for the internship, clinical phase, and basic science students, respectively. A satisfactory limit could be statistically estimated as the general average of all the performance calculated for all the participating students. It has been shown that the awareness of both the clinical phase and basic students were below this limit in most of the questions included in the questionnaire

model. This could indicate to poor awareness for those students about the BLS. It has been also shown that the students who had BLS practical training have got the highest awareness about BLS. On the other hand, the students who did not have BLS practice training have got unsatisfactory awareness about BLS. Therefore, it is highly recommended to provide practical training courses to the students and to the public.

## 1. INTRODUCTION

Ischemic heart disease is the leading cause of death in the world. According to international consensus, the most important determinant to survive a sudden cardiac arrest is the presence of a trained lay rescuer who is ready, willing, and able to act (Nolan et al., 2010; Neukamm et al., 2011; Sasson et al., 2010). Basic life support (BLS) is a level of medical care which is used for victims of life-threatening illness or injuries until they can be given full medical care at hospital. It can be provided by trained medical personnel, including emergency medical technicians, paramedics, and by qualified bystanders.<sup>[11,13]</sup>

Several studies investigated the effectiveness of medical students and peers as trainers, because of the greater availability and higher cost-effectiveness of these trainers. The medical students and peers seem to be as effective as physicians in teaching basic life support (Harvey et al., 2012; Beck et al., 2015). It is very important that every person in the community know about BLS to save lives and improve the quality of community health. At least the doctors, nursing and paramedical staff are expected to know about it, as they are frequently facing life threatening situations and the knowledge of BLS is definitely useful.<sup>[9]</sup>

In Saudi Arabia, the literature is limited in regard to the BLS knowledge among health care professionals (Alotaibi et al., 2016). Abdulrahman (Almesned et al., 2014) reviewed the BLS knowledge among healthcare students, physicians and pharmacists at Qassim University in Saudi Arabia (3) and found that the knowledge of the participant was poor. 93 medical students, 7 medical interns, 6 dentals students, 7 pharmacy students, 11 medical science students, 4 general physicians, and 11 pharmacists participated in this study. Abdullah (Abdullah et al., 2014) also investigated the awareness about the BLS among students of college of applied medical science and college of medical King Saudi Abdulaziz University of Health Sciences in Saudi Arabia and showed that the participants have poor awareness(4). However, there is no detailed information regarding BLS knowledge and attitude among the students of Majmmah University.

The aim of the current study is to investigate the level of awareness and the attitudes of the internship, clinical phase and basic science students at Majmmah University regarding the knowledge of the BLS.

## 2. MATERIAL AND METHODS

A cross-sectional, survey-based study was performed among the internship, clinical phase, and basic science students at Majmmah University about BLS. The questionnaire model is already validated by Chandrasekaran *et al.* (Chandrasekaran *et al.*, 2010) in similar study.<sup>[6,7]</sup> However, appropriate changes have been made before it was finalized for the study. It was randomly distributed among the participants along with a covering letter describing the project. The answers were then collected and analyzed using appropriate statistical methods.

The awareness score was calculated for the internship, clinical phase and basic science students. The score was normalized to the number of the students to eliminate the different number of the students in each academic year. A satisfactory limit was statistically estimated as the general average of all the scores calculated for the participated students. The general average was estimated using the following formula:

Where refers to the academic category (i.e., internship, clinical phase, or basic science), and is the number of students within each category.

Below the general average, the awareness of the participating students have been considered poor.

3. Questionnaire model

3. Questionnaire model

The questionnaire model was divided into two parts. The first part consisted of 20 questions that cover the main aspects of the BLS subject and it was designed to measure the awareness of the participants about the BLS. The second part (discussed in section 5) consisted of 3 questions and it was designed to determine the attitude of the participants regarding the BLS and investigate the effect of practical BLS training on the awareness of the participants. The 20 questions included in the first part of the questionnaire model are:

<p><b>1.What is the abbreviation of “BLS”?</b></p> <p>a) Best Life Support    b) Basic Life Support    c) Basic Lung Support    d) Basic Life Services</p>
<p><b>2.When you find someone unresponsive in the middle of the road, what will be your first response? (Note: You are alone there)?</b></p> <p>a) Open airway    b) Start chest compression    c) Look for safety    d) Give two breathings</p>
<p><b>3.If you confirm somebody is not responding to you even after shaking and shouting at him, what will be your immediate action?</b></p> <p>a) Start CPR    b) Activate EMS    c) Put him in recovery position    d) Observe</p>
<p><b>4.What is the location for chest compression?</b></p> <p>a) Left side of the chest    b) Right side of the chest    c) Mid chest    d) Xiphisternum</p>
<p><b>5.What is the location for chest compression in infants?</b></p> <p>a) One finger breadth below the nipple line    b) One finger breadth above the nipple line c) At the intermammary line    d) At Xiphisternum</p>
<p><b>6.If you do not want to give mouth-to-mouth CPR, the following can be done <u>EXCEPT</u></b></p> <p>a) Mouth-mask ventilation and chest compression    b) Chest compression only c) Bag mask ventilation with chest compression    d) No CPR</p>
<p><b>7.How do you give rescue breathing in infants?</b></p> <p>a) Mouth-to-mouth with nose pinched    b) Mouth-to-mouth and nose c) Mouth-to-nose only    d) Mouth-to-mouth without nose pinched</p>
<p><b>8.Depth of compression in adults during CPR</b></p> <p>a) 1½ – 2 inches    b) 2½ – 3 inches    c) 1 – 1½ inches    d) ½ – 1 inch</p>
<p><b>9.Depth of compression in Children during CPR</b></p> <p>a) 1½ – 2 inches    b) 2½ – 3 inches    c) One-half to one-third depth of chest    d) ½ – 1 CM</p>
<p><b>10.Depth of compression in neonates during CPR</b></p> <p>a) 1½ – 2 inches    b) 2½ – 3 inches    c) ½ – 1 CM    d) One-half to one-third depth of chest</p>
<p><b>11.Rate of chest compression in adult and Children during CPR</b></p> <p>a) 100 / min    b) 120 / min    c) 80 / min    d) 70 / min</p>

**12. Ratio of CPR, single rescuer in adult is**

a) 15:2

b) 5:1

c) 30:2

d) 15:1

**13. In a new born the chest compression and ventilation ratio is**

a) 15:2

b) 5:1

c) 30:2

d) 3:1

**14. What does abbreviation AED stands for?**

a) Automated External Defibrillator

b) Automated Electrical Defibrillator

c) Advanced Electrical Defibrillator

d) Advanced External Defibrillator

**15. What does abbreviation EMS stands for?**

a) Effective Medical Services

b) Emergency Management Services

c) Emergency Medical Services

d) External Medical Support

**16. If you and your friend are having food in a canteen and suddenly your friend starts expressing symptoms of choking, what will be your first response?**

a) Give abdominal thrusts

b) Give chest compression

c) Confirm foreign body aspiration by talking to him

d) Give back blows

**17. You are witnessing an infant who suddenly started choking while he was playing with the toy, you have confirmed that he is unable to cry (or) cough, what will be your first response?**

a) Start CPR immediately

b) Try to remove the suspected foreign body by blind finger sweeping technique

c) Back blows and chest compression of five cycles each then open the mouth and remove foreign body only when it is seen

d) Give water to the infant

**18. You are witnessing an adult unresponsive victim who has been submerged in fresh water and just removed from it. He has spontaneous breathing, but he is unresponsive. What is the first step?**

- a) CPR for two minutes and inform EMS
- b) CPR for one minute and inform EMS
- c) Compress the abdomen to remove the water
- d) Keep him in recovery position

**19. You noticed that your colleague has suddenly developed slurring of speech and weakness of right upper limb. Which one of the following can be done?**

- a) Offer him some drinks, probably hypoglycemia
- b) Possibly stroke, get him to the nearest clinic
- c) Possibly stroke, he may require thrombolysis and hence activate emergency medical services
- d) May be due to sleep deprivation, make him sleep.

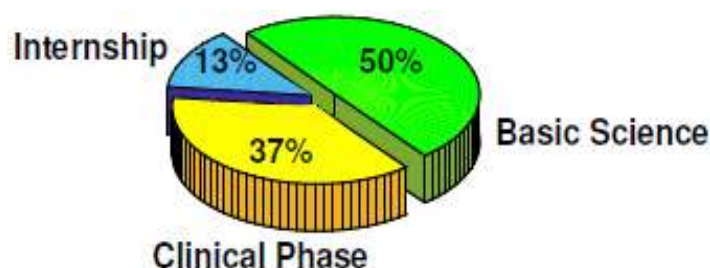
**20. A 50-year-old gentleman with retrosternal chest discomfort, profuse sweating and vomiting. What is next?**

- a) Probably myocardial infarction, hence activates EMS, give an aspirin tablet and allow him to rest
- b) Probably acid peptic disease, give antacid and Ranitidine
- c) Probably indigestion, hence give soda
- d) Take him by walk to the nearest clinic.

#### 4. RESULTS AND DISCUSSION

Number of participants in the questionnaire model.

The questionnaire model about the awareness of Basic Life Support (BLS) was distributed over a total number of 219 academics of internship, clinical phase and basic science. The participant number of each category is illustrated in Figure 1.



**Figure 1. The number, in percentage, of the participants from each academic category that participated in answering the questionnaire model performed in Majammah university about the basic life support (BLS).**

From a total number of 219 students, 13% of internship, 37% of clinical phase, and 50% of basic science students have participated in the cross-sectional study.

In order to eliminate the different between the student's number in each academic group, the awareness scores for each academic group were normalized to the number of the students within the academic group. The awareness score was represented by the total number of corrected answers given by the academic group. Then, the total number of the corrected answers was divided by the total number of the students within the academic group and represented by percentage value.

##### 1.1. Awareness assessment evaluations

The awareness of each academic category about the BLS can be evaluated through the number of the correct answers given by the academic category for each question in the questionnaire model. The awareness assessment evaluation for the internship, clinical phase, and basic science academic categories are illustrated in Figure 2 and given in Table 1. The minimum scores were remarked by different colors.

Table 1. Number of correct answers given by each academic category

NO.	NO. of correct answers		
	Internship	Clinical Phase	Basic Science
Q1	89.29	92.68	50.46
Q2	78.57	68.29	54.13
Q3	60.71	28.05	26.61
Q4	42.86	31.71	40.37
Q5	21.43	31.71	23.85
Q6	60.71	46.34	25.69
Q7	14.29	24.39	25.69
Q8	7.14	7.32	23.85
Q9	39.29	23.17	26.61
Q10	25.00	15.85	8.26
Q11	57.14	43.90	36.70
Q12	92.86	54.88	58.72
Q13	3.57	15.85	12.84
Q14	53.57	18.29	25.69
Q15	67.86	65.85	39.45
Q16	25.00	35.37	22.94
Q17	64.29	39.02	27.52
Q18	42.86	24.39	14.68
Q19	64.29	26.83	24.77
Q20	75.00	40.24	33.94

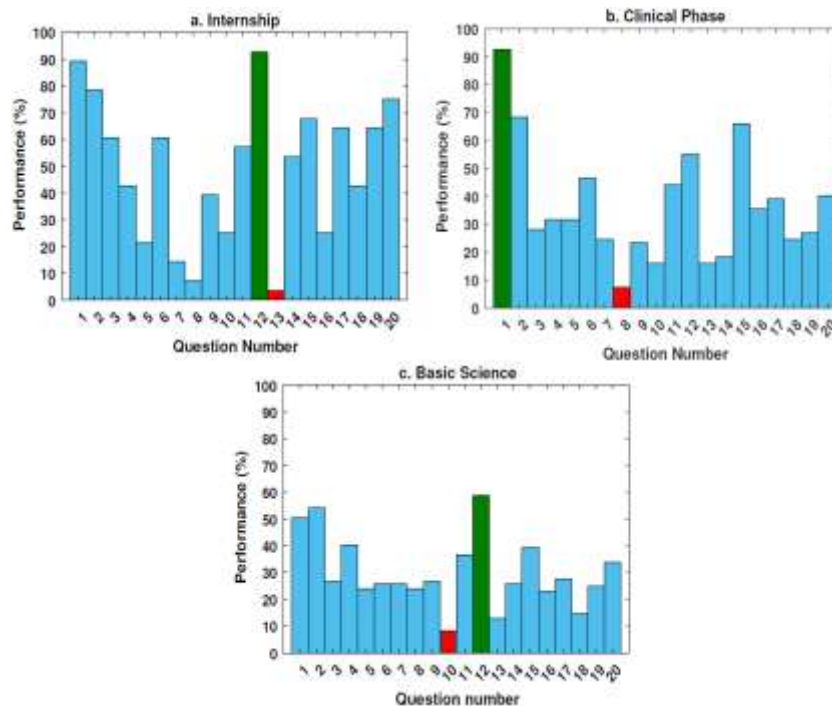


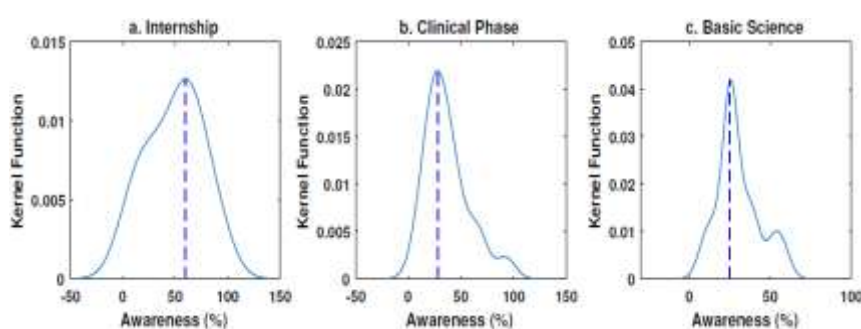
Figure 2. Performance of the academics participated in answering the questionnaire model about BLS. The minimum and maximum awareness were highlighted at the corresponding question by red and green colors.



For internship participants, the question number 13 was the most difficult one, while the answer of question 12 was the most known one. For the clinical phase students, the question number 8 was the most difficult one, while the answer of question 1 was the most known one. Question number 10 was the most difficult for the basic science students, while question number 12 was very common. It worthwhile to mention that the answer of question 12 was most known one for both the internship and the basic science academic categories.

## 1.2. Distribution of the results

The distribution of the awareness (number of correct answers) of each category has been computed using kernel function as illustrated in Figure 3.



**Figure 3. Distribution of awareness calculated for the participation academics in the questionnaire model about the Basic Life Support (BLS). The peak of the distribution was represented by dashed line.**

The awareness in % that corresponds to the maximum height of the kernel function will be used to indicate the awareness of each academic category. The awareness score of each academic group is presented in Table 2.

**Table 2. Awareness of different academic categories about the Basic Life Support (BLS).**

Category	Awareness
Internship	60.14%
Clinical Phase	28.24%
Basic Science	25.11%

It is to be concluded that the maximum awareness score has been reported for the internship students. While, the minimum awareness score has been observed for basic science academic category. A comparison between the awareness of each academic group regarding to each question in the questionnaire model about the BLS is illustrated in Figure 4.

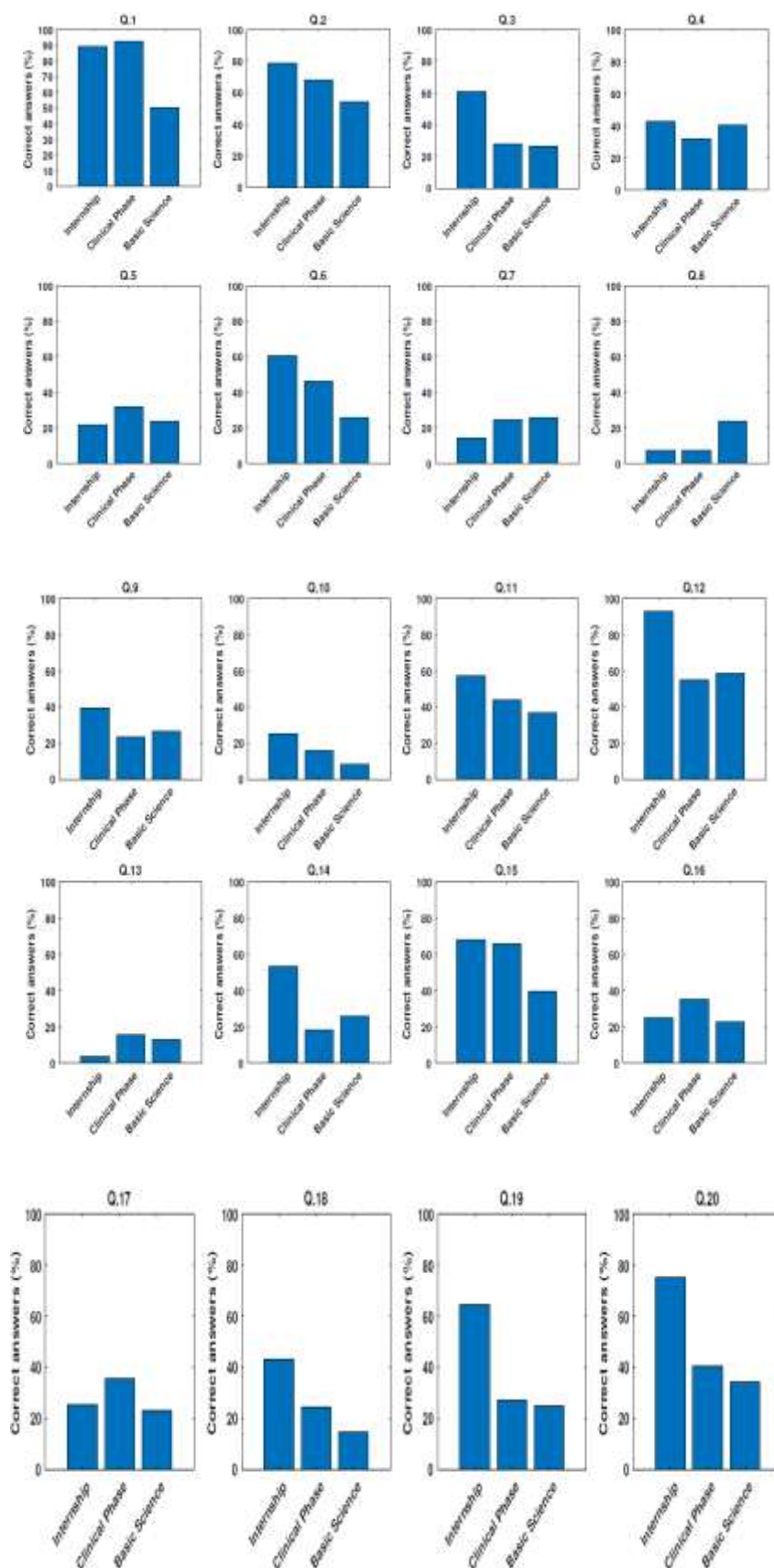
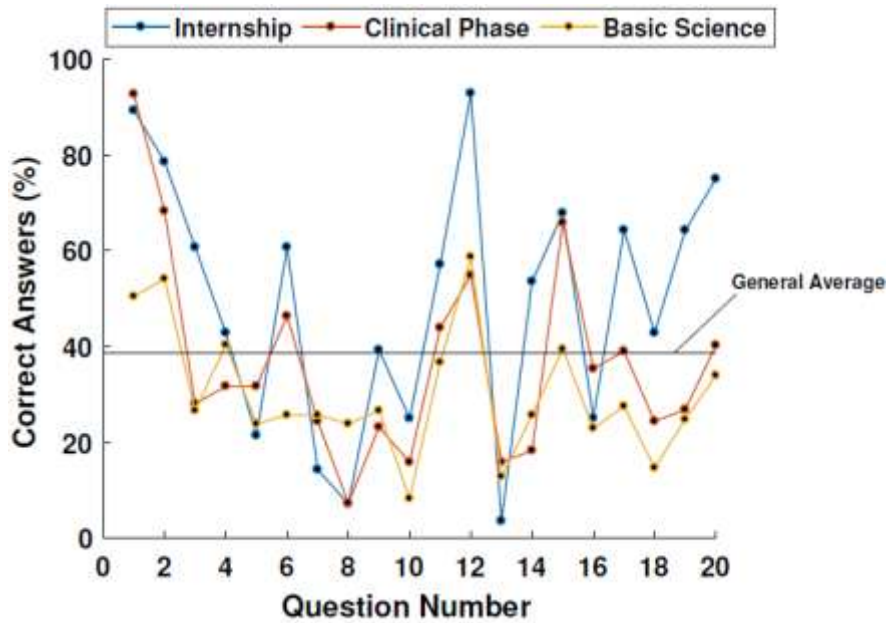


Figure 4. Comparison between the awareness of each academic category at each question in the questionnaire model.

### 1.3. Trend and general awareness assessment

In order to make a general conclusion about the awareness of the participants from the different academic groups, the number of the correct answers given by each category were investigated for each question. The general average of all the evaluated awareness was calculated in order to indicate to the satisfactory limit. The results are presented in Figure 5.



**Figure 5.** The trend of the awareness computed for the internship, clinical phase and basic science academic categories. The general average is represented by solid black line.

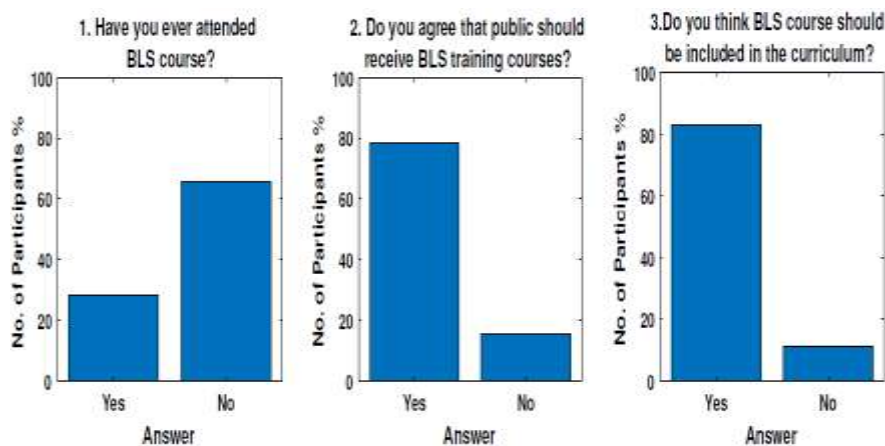
The awareness computed for the clinical phase and basic science academic categories for the most questions of the questionnaire model were below the general average. This implies that those students have poor awareness about the BLS. While, the awareness scores for the internship students at the most of the questions given in the questionnaire mode were above the general average indicating to satisfactory awareness.

### 5. Attitude of the participants regarding the BLS

In order to investigate the attitude of the participants regarding the importance that the public should have good awareness about the BLS, three questions have been asked to the participated students in the cross-section study regarding the BLS. The three questions are given as:

- |   |
|---|
| <b>1. Have you ever attended BLS course before?</b>                     |
| <b>2. Do you agree that public should receive BLS training course?</b>  |
| <b>3. Do you think BLS course should be included in the curriculum?</b> |

After collecting the answers and considered the missing ones, the results are illustrated in Figure 6.



**Figure 6. Attitude of the participants toward the importance that the public should have good knowledge in BLS.**

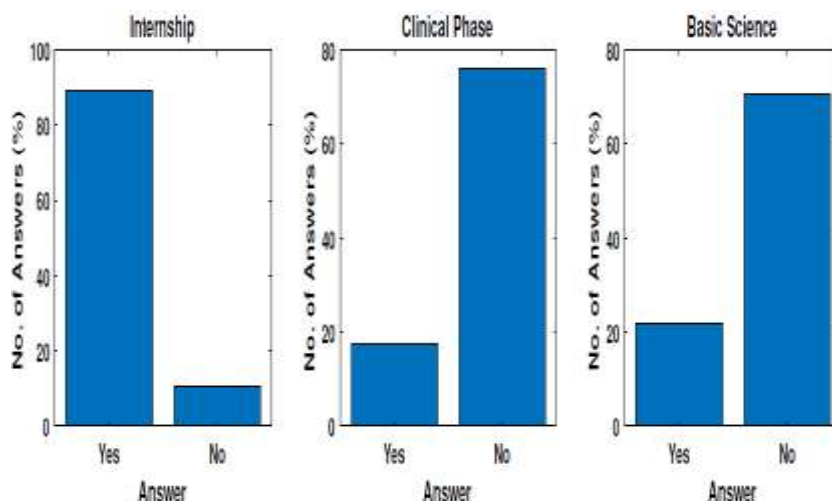
It is obvious from the figure that about 60% of the participants have not attended to BLS courses. Nevertheless, about 80% see that the public should receive BLS training courses. Furthermore, more than 80% of the participants believe that the BLS courses should be included in the curriculum. This, in fact, reflects the importance that the public should have good awareness about the BLS.

It should be noted that more than 60% of the participants have not attended BLS course. This should consider as bad sign for the community. Therefore, it is highly recommended to consider training courses for the BLS for the public. Furthermore, the researchers should investigate and suggest appropriate methods to increase the awareness of the public regarding the BLS.

## **6. Effect of attending the BLS training course on the awareness evaluation**

As it was discussed in the previous section, both of the clinical phase and basic students have low awareness about the BLS. On the other hand, the internship students have high awareness about the BLS. Therefore, one may ask whether attending the BLS courses has affected the

awareness level of the participants. In order to answer this question, the participants have been asked if they have already attended BLS course. The results are illustrated in Figure 7.



**Figure 7. Number of students who attended the BLS course.**

It is obvious that about 90% of the internship have attended BLS courses. This, in fact, explains the high awareness those students have about the BLS. On the other hand, most of the clinical phase and basic science students have not attended BLS courses. Hence, the awareness level of those students were unsatisfactory low.

## 7. Comparison with other studies

Different cross-section studies about BLS were conducted in different countries and places. Chandrasekaran et al. (Chandrasekaran et al., 2010) studied the awareness of BLS among students, doctors and nurses of medical, dental, homeopathy and nursing college. They concluded that no one among them has complete knowledge of BLS. They showed that about 85% of them had scored less than 50% marks, only ~0.2% had scored 80-89% marks, ~0.95% had scored 70-79% marks, ~4% had scored 60-69% marks, and ~10% had scored 50-59% marks. Hence, they have drawn a general conclusion that the awareness of BLS among students, doctors and nurses of medical, dental, homeopathy and nursing college is very poor.<sup>[6,7]</sup>

Reddy et al. (Reddy et al., 2013) assessed the awareness of BLS among third, fourth and fifth year bachelor of Dental Surgery (BDS) clinical students, dental interns, postgraduate students and Master of Dental Surgery (MDS) faculty of Penineeya Institute of Dental Science and Hospital, Hyderabad in India. They concluded that there is a significant lack of knowledge

among the postgraduate students BDS and MDS faculty regarding BLS when compared the third, fourth and fifth year's clinical BDS and dental interns. Therefore, they emphasized the need for all health care professionals to regularly update the knowledge and skill regarding BLS.<sup>[12]</sup>

Gonzaga *et al.* (Gonzaga *et al.*, 2003) evaluated the awareness of dentists about cardiopulmonary resuscitation (CPR). They reported that only 46% had a correct concept.<sup>[8]</sup>

However, the most important conclusion that none of them had received practical training in CPR. This in fact support the idea of the current research that the practical training has significant effect in increasing the awareness about the BLS.

In Saudi Arabia, Almesned *et al.* (Almesned *et al.*, 2014) reviewed the awareness of BLS among health-care students, physicians and pharmacists at Qassim University. They reported that 1.4% scored 90-99% and these individuals were fifth year medical students, 4.3% had scored 80-89%, 7.9% had scored 70-79%, 16.5% had scored 60-69%, 20.1% had scored 50-59%, and 49.6% had scored less than 50%. Therefore, a general conclusion was given that the students have very poor knowledge about the BLS.<sup>[3]</sup>

Alanazi *et al.* (Alanazi *et al.*, 2014) investigated the awareness of BLS among the students of College of Applied Medical Science (CAMS) and College of Medicine (COM) at King Saud Bin Abdulaziz University of Health Science (KSAU-HS). They found that about 63.4% and 67.4% of the students of CAMS and COM, respectively, had scored less than 50%. Furthermore, none of the COM students scored more than 80% and only about 1.4% had scored 70%. Almost the same attitude was found in COM students. About only 6% had scored 90-100%, 3% had scored 80-89%, 8% had scored 70-79%, 7% had scored 60-69%, 13% had scored 50-59%. The average scores for CAM and COM students were 45.05 and 37.9% respectively. Therefore, they concluded that the students of CAMS and COM have poor awareness about the BLS.<sup>[2]</sup>

This literature supports that results and the objects of the current research that practical training about BLS is highly recommended and required. Thereby, the researchers should investigate and suggest the methods of providing the BLS courses to the students in schools and university and to the general public.

## 8. General discussions

A questionnaire model of 20 questions covering the basic points of the subject was distributed over the students. A total number of 219 students including 13% internship, 37% clinical phase and 50% basic science academic students. The responses of the students have been collected and analyzed using the appropriate statistical methods.

The awareness was measured using an appropriate scoring method. The number of the corrected answers given by each academic group was used to evaluate the awareness score for the academic group. However, the score of each academic group was normalized to the number of the students within the group in order to eliminate the differences between the student's number of each academic group. The general average of the scores of the three academic group was estimated and set as the minimum satisfactory limit. Below this limit, the awareness was considered poor.

It has been shown that the internship students have the maximum awareness about the BLS in comparison of the other students. More than 60% of them could give the correct answers of the questionnaire model questions. While, the clinical phase and basic science students have the lowest awareness about the BLS. Only 28% and 25% of the clinical phase and basic students, respectively, could give the correct answer of the questionnaire model.

It has been also shown that the answer of question number 12 which was about the ratio of the CPR single rescuer in adult was the most question with a very well-known answer, especially between the internship and basic science students. While, the most difficult question for the internship students was question number 13 which asking about the correct chest compression and ventilation ratio in a new born since less than 5% of the students could give the correct answer. For the clinical phase student, question number 8 that was asking about the depth of compression in adults during CPR was the most difficult question since less than 10% of the students could give the correct answer this question. For the basic science students, question number 10 asking about the depth of compression in neonates during the CPR was the most difficult questions. Only 10% of the basic science students could give the correct answer.

In order to indicate a final evaluation of performance for the awareness of the academic students participated in this cross-section study, a minimum satisfactory limit was statistically estimated as the general average of all the calculated performance for the three academic

scientific categories. Hence, below this value, the performance is considered unsatisfactory, otherwise not. It has been shown in most of the questions, the awareness of both the clinical phase and basic science student were below this value. In other words, the awareness of those students were unsatisfactory.

It should be also noted that although most of the participants have not attended training courses about BLS, they believe that the public should have a good knowledge about BLS. Furthermore, they think the adding the BLS courses to the curriculum is important. Therefore, it is highly recommended that the public should have good awareness about the BLS. The researchers have to investigate the appropriate method to provide the public with the required training courses.

It has been also shown that most of the internship students have attended BLS courses. Therefore, they have the highest awareness about the BLS in comparison with the other students. On the other hand, most of the clinical student have not attended BLS courses and thereby they have unsatisfactory awareness about the BLS.

## 9. CONCLUSIONS

- A cross-section study about the basic life support (BLS) was conducted among the students in Majmmah university.
- The awareness of the internship, clinical phase, and basic science students have been evaluated using appropriate statistical methods.
- The awareness of each academic group was measured by a score estimated using the number of the corrected answers given by each academic group.
- The general average of the scores of the three academic group was estimated and set as the minimum satisfactory limit. Below this limit, the awareness was considered poor.
- The internship students have the highest awareness about the BLS in comparison with the clinical phase and basic science students.
- Question numbers 13, 8 and 10 were the most difficult questions for the internship, clinical phase, and basic science students, respectively.
- The answer of question number 12 was the most common answers among the students, especially the internship and basic science students.
- In most of the questions included in the questionnaire mode, the awareness of both the clinical phase and basic science students were below the satisfactory limit.
- It is highly recommended to that the public should have training courses in PLS.



- The students who attended BLS courses has the highest awareness in comparison with the other students who have not attended the BLS courses.

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