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ORIGINAL RESEARCH

Basic Life Support (BLS) Knowledge Among General Population; a Multinational Study in Nine Arab Countries

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Abstract: **Introduction:** Basic Life Support (BLS) is a medical treatment used in life-threatening emergencies until the sufferer can be properly cared for by a team of paramedics or in a hospital. This study aimed to assess the level of knowledge regarding BLS and the contributing factors among the Arab non-medical population. **Methods:** An online survey-based cross-sectional study was conducted among non-medical populations in nine Arab countries between April 13, 2022, and June 30, 2022. The utilized questionnaire consisted of two parts: part one included socio-demographic characteristics and part two measured knowledge of BLS through an online survey. **Results:** The research included a total of 4465 participants. 2540 (56.89%) of the participants were knowledgeable about BLS. The mean basic life support knowledge scores of participants who received training were higher than those who had not (20.11 ± 4.20 vs. 16.96 ± 5.27; p< 0.01). According to the nations, Yemen scored the highest, while Morocco had the lowest levels of BLS knowledge (19.86 ± 4.71 vs. 14.15 ± 5.10, respectively; p< 0.01). Additionally, individuals who resided in urban areas scored on average higher than those who did in rural areas (17.86 ± 5.19 vs. 17.13 ± 5.24, p= 0.032) in understanding basic life support. Age, information sources, and previous training with theoretical and practical classes were significant predictors of BLS knowledge. **Conclusion:** The level of BLS knowledge among non-medical people in Arab nations is moderate but insufficient to handle the urgent crises that we face everywhere. In addition to physicians being required to learn the BLS principles, non-medical people should also be knowledgeable of the necessary actions to take in emergency events.

Keywords: Awareness; basic life support; cardiopulmonary resuscitation

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1. Introduction

Basic Life Support (BLS) is the first line of management for an illness or injury, generally by any bystander, until medical intervention can be started (1). Patients' survival probability depends on early detection of symptoms, early access to emergency medical services, and early BLS provided

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by bystanders. Additionally, studies have shown that BLS can reduce recurrence and complications of the disease (2). BLS standard includes recognition of sudden cardiac arrest (SCA), heart attacks, strokes, and foreign body airway obstructions, as well as the use of automated external defibrillators for cardiopulmonary resuscitation (CPR) and defibrillation (3). Certain illnesses or minor injuries can be treated with appropriate BLS without requiring medical consultation or risk of life loss (4). So, BLS knowledge should be adequate for individuals to deliver lifesaving measures in emergencies (5,6). In different communities, sudden cardiac arrest, the leading cause of death worldwide, is associated with varying survival rates (7,8). Early recognition of cardiac arrest and initiating CPR reduce morbidity and mortality (7,9,10) In a previous study conducted in Arizona, bystander CPR rates increased from 28.2% to 39.9%, and out-of-hospital cardiac arrest (OHCA) survival rates increased from 3.7% to 9.8% following a statewide hands-only CPR campaign (11). In the United States, there are approximately 300,000 cases of OHCA, with a 92% mortality rate (11). BLS is performed by the first person to intervene, and using an AED doubles the chances of survival (11). There are several reasons bystanders have difficulty performing CPR: inadequate knowledge or training, a lack of skill or confidence, and a fear of legal action (11). In a study conducted in Saudi Arabia, which included 301 participants, only 39.2% passed the test that valued the theoretical knowledge of BLS even though the percentage of participants with bachelor's degrees exceeded 60% (12). Researchers conducted an observational study with 121 participants, including dental personnel, house officers, and nurses, and found that the average health care worker lacked adequate CPR and BLS knowledge (13). The same results were found in another study conducted at a medical school in Oman. Of 304 medical students, 53.6% had insufficient knowledge, and 64.5% had no previous BLS training. However, the study stated that the students showed positive attitudes toward BLS training and were not hesitant to provide BLS to a stranger if needed (14). The community requires adequate training on BLS, either in person or online, to provide proper care (15). Increasing public awareness and understanding of how BLS works is essential for a successful outcome following an emergency. The knowledge and perception of BLS among the Arab community have not been assessed. In general, non-medical individuals do not receive formal training in BLS, leading to lack of knowledge. This study aimed to assess the level of knowledge regarding BLS and the contributing factors among the Arab non-medical population.

2. Methods

2.1. Study design and setting

An online survey-based cross-sectional study was conducted among the non-medical population in most Arab countries across social media (Jordan, Iraq, Egypt, Palestine, Bahrain, Yemen, Syria, Sudan, Algeria, and Morocco) using an internet-based approach to communication (social media) such as Facebook and Twitter from April 13, 2022, to June 30, 2022, to assess their knowledge about BLS. Two national collaborators distributed the survey, and a secure platform was used (Microsoft Forms Forms). Only the lead investigator had access to the data; all responses were anonymous and devoid of identifying information.

Institutional Review Board (IRB) approval was also obtained from the Research Ethics Clearance Committee of Gadarif Teaching Hospital. Consents were obtained from all participants before starting to fill out the online survey on the first page. All participating universities were provided with a report of data results and their interpretation, which may be used for educational program development. Furthermore, the study was performed adhering to the ethical principles introduced in the Declaration of Helsinki.

2.2. Participants

The sample population was chosen through a convenience sampling method. Only Arab individuals over 18 who lived in the included countries and were not members of the medical field were included in our study; however, we excluded individuals under the age of 18 who did not reside in the included countries and members of the medical sector. After removing the duplicate entries, only fully completed replies were considered.

2.3. Data gathering

The study questionnaire was adopted from a similar study conducted in Gondar Town (16). The questionnaire was translated into Arabic by a translator with a master's degree. After three experts evaluated the Arabic and original versions, the translation was finalized. Cardiology professionals evaluated the questionnaire's clarity and validity, followed by a pilot study with a 10% sample size (approximately 300 participants). The whole data set did not include the pilot study's sample data. As determined by Cronbach's Alpha, internal consistency was 0.841 (0.8 to 0.9: good reliability). Participants could go back and change their answers.

The questionnaire (supplementary file 1) was divided into two sections:

A socio-demographic section: Consisted of questions about personal information, including age, gender, nationality, education, marital status, residence, job status, and whether the participant had previously received BLS training.

Knowledge of BLS: This section comprised general questions related to BLS definition and its principles including, the adequate time and person for performing it, knowledge of and recognizing the signs of cardiac arrest, such as being unconscious, absence of breathing, and absence of circulation, as well as the essential components of basic life support such as moving patients from accident site, stopping bleeding, applying splinting for fractures, contacting emergency medical service, and transporting patients to hospitals, and the signs of airway problems, including noisy breathing, fast breathing, slow breathing, and no breathing, and the procedures to open airway or giving breath, including jaw thrust, head tilt and chin left, mouth to mouth, mouth to nose, and the signs of bleeding, including bleeding from the injured site, victim collapsing, weak and fast pulse, and increase in respiratory rate, and preventive measures to stop the bleeding including, applying tourniquet, applying pressure and dress, and lift the injured part above the body level, and finally, the preventive measures that should be performed during transporting the patient from the accident site to the hospital.

The right answer was coded as "1," whereas the wrong answer or “I don’t know” answer was coded as "0." Following the addition of the right responses, individuals with scores above the mean were classified as having adequate knowledge of basic life support. In contrast, those with scores below the mean were categorized as having poor knowledge of basic life support.

2.4. Statistical analysis

A single population proportion formula [n = [(Za/2)2. P (1-P)]/d2] was used to estimate the minimum sample size. P = percentage of non-medical people in Gondar Town, Ethiopia, who were knowledgeable about basic life support (44.4%) (16), assuming a 95% confidence level (Z a/2 = 1.96), a margin of error of 5%, and a 5% addition for non-response rate. The recommended sample size was 380 individuals. Participants were urged to fill out the online survey on Microsoft Forms, which received 4499 responses in total. After 34 participants indicated that they would not answer the questionnaire, the final sample size was 4465.

After data collection, we used Excel to check the data and convert the string into codes. Then we exported the Excel sheet to SPSS version 28. We ran a descriptive analysis to describe the frequency and percentages, and check if the data were normally distributed.

Statistical tests such as the Shapiro-Wilk test were used to test normality. Analysis of variance (ANOVA) was performed to investigate the difference in BLS knowledge between groups defined by the independent variables. We used to compare the means between the dependent and independent variables to calculate the mean and standard deviation. Finally, we used a stepwise multiple linear regression to define the best predictors of BLS knowledge and the variables used were age, gender, residence (rural vs urban), education, marital status, nationality, information source, whether respondent faced an emergency, whether received training or not, type of training and number of sessions of training. A P-value below 0.05 was considered a statistically significant value. Missing data is a common problem when conducting cross-sectional studies. Therefore, we used complete case analysis method where we excluded participants with missing data from analysis. But to avoid bias that may occur if the missing data were not missed completely random, we conducted sensitivity analysis to evaluate the potential impact of missing data on our study results to avoid bias as much as possible and increase the validity of our finding.

In order to minimize the impact of different bias to the results we took the following measures: firstly, we used a representative sampling method to select participants from a diverse range of socioeconomic backgrounds and geographic locations. This helped to reduce selection bias by ensuring that the study population was as representative as possible of the target population. Second, we used standardized measurement tools and data collection procedures to ensure that all participants were evaluated in a consistent and uniform manner. This helped to reduce measurement bias and ensure that the results were comparable across participants. Third, we carefully considered and controlled for potential confounding variables that may have influenced the relationship between the exposure and outcome variables. For example, we controlled for age, gender, education level, and other relevant demographic factors that may have impacted our results. Finally, we conducted a sensitivity analysis to evaluate the potential impact of any unmeasured or residual confounding variables that may have influenced our results.

3. Results

3.1. Socio-demographic characteristics of participants

Among a total of 4465 study participants, the most frequent age group was 12-24 years (n= 2143 (48.0%)), while the least frequent age group was >65 years (n= 65 (1.5%)). Study included 2657(59.5%) females, 3561(79.8%) urban residents, and 2867 (64.2%) single participants. A large proportion of study participants (3404 (76.2%)) did not take any training regarding BLS. Among participants, 2110 (47.3%) had heard about BLS. Furthermore, 1113 (29.2%) participants faced a case that required BLS. The study included more than nine Arab countries, with the largest proportion of respondents coming from Jordan, 850 (19.0%) (Table 1).

3.2. Knowledge of Basic Life Support (BLS)

Among 4465 participants who took part in the study, 2540 (56.89%) were knowledgeable about BLS. Trained participants possessed higher BLS knowledge scores than those who had not been trained (20.11 ± 4.20 vs. 16.96 ± 5.27; p =0.01). Moreover, participants who resided in urban areas had a significantly higher mean score of BLS knowledge than those from rural areas (17.86 ± 5.19 vs. 17.13 ± 5.24; p= 0.03). Yemeni participants scored the highest mean score on BLS knowledge, while Morocco scored the least (19.86 ± 4.71 vs.14.15 ± 5.10; p <0.01). Health-sector employees scored the highest mean of BLS knowledge (20.27 ± 4.28). Also, previous BLS training sessions affected their score greatly to be significantly higher than those who did not get any previous training (20.11 ± 4.20 vs16.96 ± 5.27- p= 0.02; Table 2 and Figure 1). Furthermore, the individuals that are knowledgeable about the BLS were mostly Yemeni (19%) and Jordanian (17%) participants (Figure 2).

3.3. Factors associated with knowledge of participants about BLS

A stepwise multiple linear regression analysis was performed to build a significant model with a p-value <0 .001 and an R-squared value of 0.91, which means the model can explain 91% of the variance in the BLS knowledge score. No violations of linearity were detected. Age, information sources, and previous training with theoretical and practical classes were significant predictors of BLS knowledge.

Receiving information about BLS from reading sources and health professionals was associated with better BLS knowledge scores than other information sources. Additionally, age groups 45-54 and 55-64 are better predictors of a higher BLS knowledge score than other age groups (Table 3).

4. Discussion

The present study aimed to evaluate the knowledge of BLS among the general public in several Arab countries. A total of 4465 participants were included in the study, representing a diverse range of socio-demographic characteristics. Results of the study revealed that 56.89% of the participants had adequate knowledge about BLS, with prior training and age being the most significant factors impacting the degree of knowledge.

The study found that a large proportion of participants (76.2%) did not receive any training regarding BLS, and only 47.3% of participants had previously heard about BLS. Additionally, only 30.1% of participants had faced a case that required BLS. These findings suggest that there is a significant gap in the knowledge and understanding of BLS among the general public in the Arab countries included in the study.

The results also revealed that urban dwellers and those who had previously received BLS training had higher mean scores than those who did not. Furthermore, being an employed male participant and residing in age groups (45-54) and (55-64) were the factors contributing most to BLS knowledge. Older male participants and those who had more exposure to such situations had higher knowledge scores in BLS.

In terms of country-specific results, participants from Yemen scored the highest mean score on BLS knowledge, while participants from Morocco scored the lowest. This suggests that there may be significant variation in the knowledge and understanding of BLS among different Arab countries, highlighting the need for targeted interventions to improve BLS knowledge in specific countries.

The study also found that receiving information about BLS from reading sources and health professionals was associated with better BLS knowledge scores than other information sources. This highlights the importance of providing accurate and accessible information about BLS to the general public through various media sources.

Training raises awareness, which contributes to raising the degree of knowledge compared to individuals who never get training, as documented in previous research, and this may be confirmed by the fact that trained personnel performed better than untrained personnel in the study (12,15,17-20). A crucial argument is that, despite certain participants' expertise and experience, it is unfair for them to get involved in the situation or administer CPR unless they have a legal obligation to do so (20).

Study results showed that older participants who aged more than 45 years had higher knowledge scores than younger participants. This finding is consistent with the findings of the Saudi Arabia research, which revealed that older participants had greater knowledge scores than younger participants, even though the majority of the samples gathered are from younger age groups. Older persons have been exposed to more cases that need BLS as they have aged (18).

In this research, male participants had greater knowledge scores than females. even though there were more women than men in the population.

The findings of this research may be attributed to the cultural and societal factors present in the Middle Eastern nations where the study was conducted. Specifically, the conservative nature of these societies may have led to a higher level of knowledge and exposure to relevant scenarios among males, as compared to females. This is supported by the findings of a previous study conducted in Portugal, which also highlighted the role of work environments in providing opportunities for exposure and the exchange of information related to these situations among males (21).

The present study found that knowledge of Basic Life Support (BLS) is greater among urban inhabitants as compared to rural ones. This difference may be attributed to the fact that ur-

ban populations tend to have higher levels of education and better access to educational resources, including BLS training programs. Conversely, rural populations may have limited access to educational resources, and poor educational abilities, which can impede their ability to learn from various sources such as reading. Furthermore, urban communities have greater access to shareable information, including media sources, which may have contributed to their increased knowledge of BLS.

Additionally, the study found that individuals who were employed performed better on the BLS knowledge test than those who were unemployed. This is likely due to the fact that those working earn greater wages, which allow them to afford to attend BLS courses and receive training. However, the high tuition for these courses may prevent unemployed individuals from enrolling, highlighting the need for government-funded initiatives to provide BLS training to fill the gap created by discrepancies in wages and educational levels (22).

The study also found that participants in the healthcare industry performed better than those in other occupations, which may be due to the nature of their work and its impact on their knowledge of BLS. Furthermore, the study found that having access to the media and the internet may be a key factor in determining the response rate, which could explain why the response rate was greater in Jordan and lower in Iraq. However, Yemen had the highest mean score, with only 8% of participants coming from Yemen classified as having poor knowledge of BLS. Conversely, participants from Egypt, Jordan, and Syria comprised 51% of this total. Additionally, Yemen had a higher mean score than any other nation because it is a war-torn nation with a greater need for basic life support than other nations (23).

This study showed a higher percentage of the population who had knowledge regarding the BLS compared to some studies conducted on non-medical staff such as those performed in Addis Ababa (17) among kindergarten teachers, Iran (24) within a school environment, and Saudi Arabia over the general population (18), which reported 40.0%, 45.8%, 40.3% knowledgeable population, respectively; closer to percentages reported in other studies conducted in Addis Ababa (25) among medical and non-medical students and Saudi Arabia among rural mothers (26), which reported 50.3% and 50.0% knowledgeable population, respectively; in line with results reported in a study conducted in China among elderly population (27) with 57.3%; and lower than the percentage reported in Egypt among rural mothers (19) with 74.3% of participants showing a considerable knowledge regarding BLS.

The variations are caused by different tools and cut-off points. Variations in the educational backgrounds of included individuals also play an essential role in their awareness.

5. Recommendations

Based on the findings of the present study, recommendations for improving BLS knowledge and understanding among the general public in Arab countries include:

• Providing affordable and accessible BLS training courses to the general public

• Raising public awareness of the importance of BLS through various media sources

• Targeted interventions to improve BLS knowledge in specific countries with lower scores

• Encouraging health professionals to provide information and education on BLS to the general public

• Promoting policies and initiatives that make it easier for people to access BLS training.

The present study highlights the need for targeted interventions to improve the knowledge and understanding of BLS among the general public in Arab countries. By making BLS training more accessible and affordable, raising public awareness of the importance of BLS, and providing accurate and accessible information about BLS through various media sources, it is possible to improve BLS knowledge and understanding among the general public, ultimately leading to better outcomes in emergency situations.

6. Limitations

The present study has several limitations that should be acknowledged. Firstly, the study was conducted solely in Arab countries and may not be generalizable to other populations or regions. Additionally, the study relied on self-reported data, which may introduce bias and inaccuracies in the results. Furthermore, the study did not assess the practical skills and abilities of the participants in performing BLS, only their knowledge and understanding of the subject. It would be important to conduct further research to evaluate the practical skills and abilities of the general public in performing BLS. Additionally, the study only measured the knowledge and understanding of BLS among the general public and did not assess the knowledge and understanding of BLS among healthcare professionals. Future research could also focus on evaluating the knowledge and understanding of BLS among healthcare professionals in Arab countries. Finally, the study relied on online surveys, which may not have reached individuals without internet access or those who were not comfortable taking online surveys. This could have resulted in a selection bias and may have affected the representativeness of the sample.

7. Conclusion

Results showed that 56.89% of participants had adequate knowledge about BLS, and that factors such as previous

training and age were associated with higher BLS knowledge scores. The study also found that urban residents and those who had received BLS training had higher mean scores than those who had not. Additionally, being an employed male participant and belonging to the age groups of 45-54 and 55-64 were found to be factors that contributed most to BLS knowledge. The study highlights the need for measures such as making BLS courses more accessible and affordable, and raising public awareness about the importance of BLS through various media sources in order to increase the number of people with adequate knowledge about BLS. Overall, the study suggests that while the level of BLS knowledge among non-medical individuals in Arab countries is moderate, it is still insufficient to handle emergency situations, and there is a need for further education and training to ensure that individuals are prepared to respond in emergency situations.

8. Declarations

8.1. Acknowledgments

We would like to express our gratitude to the Data Collection group for their valuable contribution to this project. Their efforts in collecting and organizing the necessary data have been instrumental in the success of our research. We greatly appreciate their assistance and dedication throughout the data collection process.

8.2. Conflict of interest

The authors declare that they have no competing interests.

8.3. Funding and support

None.

8.4. Authors' contribution

Nour Shaheen: Conceptualization, Methodology, Formal Analysis, Writing-Original draft, review, and editing. Ahmed Shaheen, Rehab Adel Diab, Abdelrahman Mohmmed, Abdelraouf Ramadan, Sarya Swed, Muhannad Wael, Mrinmoy Kundu, Sama Soliman, Mohamed Elmasry, Sheikh Shoib: Writing-Review and editing.
All authors read and approved the final manuscript.

8.5. Data Availability

The data supporting this study's findings are available from the first author, [Nour Shaheen], upon reasonable request.

8.6. Ethical Approval

The study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards. Ethical approval was also obtained from the Research Ethics Clearance Committee of Gadarif Teaching Hospital. Consents were obtained from all participants before starting to fill out the online survey.

8.7. Data collection group

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Table 1: Socio-demographic characteristics of the studied samples (N=4465)

Variables	Values	Variables	Values
Age (years)		Nationality	
12-24	2143 (48.0)	Jordanian	850 (19.0)
25-34	1213 (27.43)	Egyptian	553 (12.4)
35-44	570 (12.8)	Palestinian	473 (10.6)
45-54	344 (7.7)	Bahraini	420 (9.4)
55-64	130 (2.9)	Yemeni	633 (14.2)
Above 65	65 (1.5)	Syrian	488 (10.9)
Gender		Algerian	401 (9.0)
Male	1765 (39.5)	Sudani	490 (11.0)
Female	2657 (59.5)	Moroccan	60 (1.3)
Residency		Other	97 (2.2)
Urban	3561 (79.8)	Job status	
Rural	904 (20.2)	Unemployed	511 (11.4)
Education		Entrepreneur/freelancer	992 (22.2)
PhD	9 (0.2)	Employed	1338 (30.0)
Masters	52 (1.2)	Health-sector employee	631 (14.1)
University degree	3759 (84.2)	Student	898 (20.1)
Professional diploma	31 (0.7)	Retired	75 (1.7)
High school	5 (0.1)	BLS training	
Secondary education	582 (13.0)	Yes	1061 (23.8)
Primary education	17 (0.4)	No	3404 (76.2)
Other	10 (0.2)	Ever heard about BLS	
Marital status		Yes	2110 (47.3)
Married	1514 (33.9)	No	2355 (52.7)
Single	2867 (64.2)	Facing a person in need of BLS	
Widowed	84 (1.9)	Yes	1344 (30.1)

Data are presented as frequency (%). PhD: Doctorate of Philosophy; BLS: basic life support.

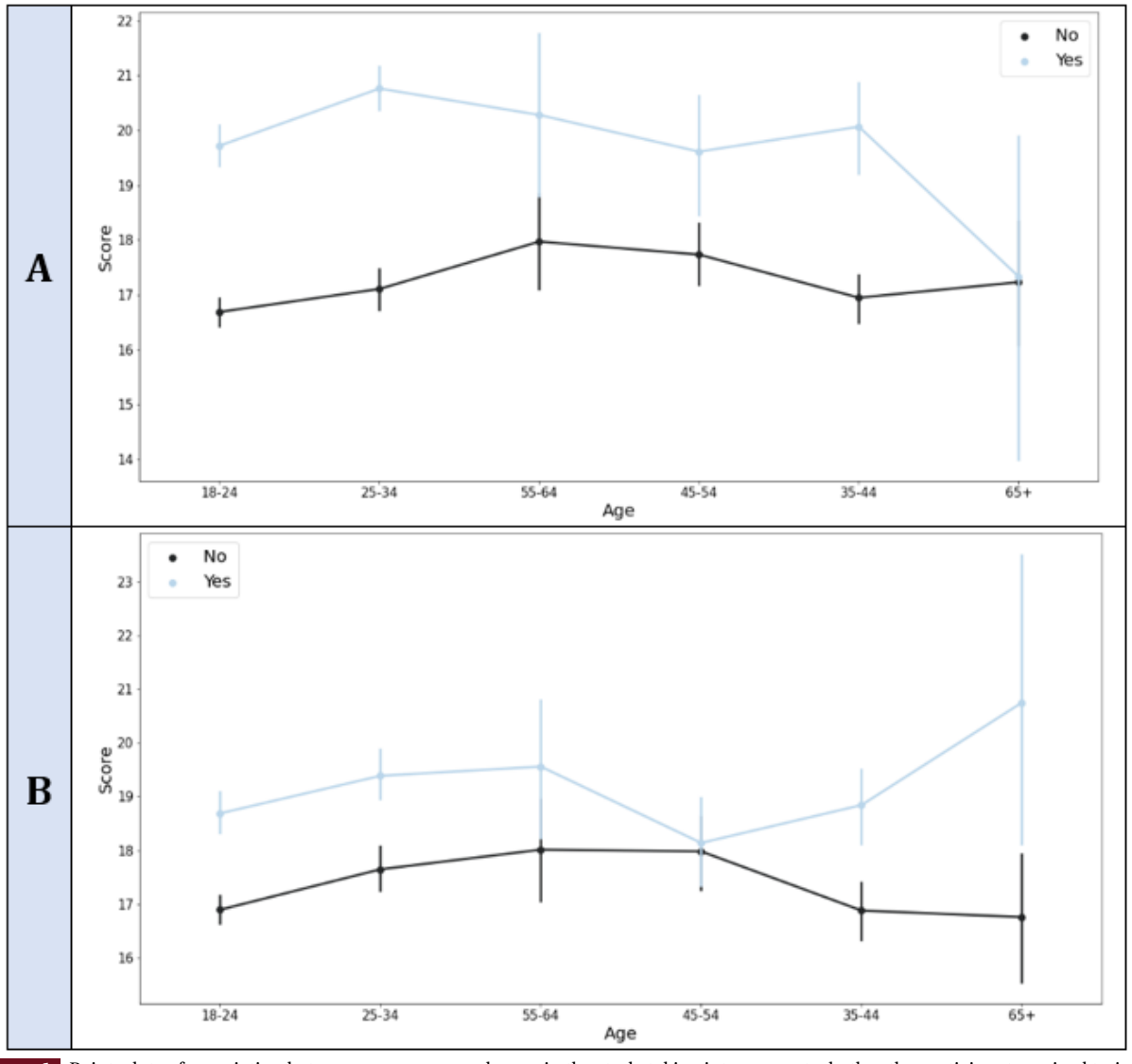

Figure 1: Point-plots of association between age groups and score in the study taking into account whether the participant received training in (A) and faced an emergency requiring BLS or not (B).

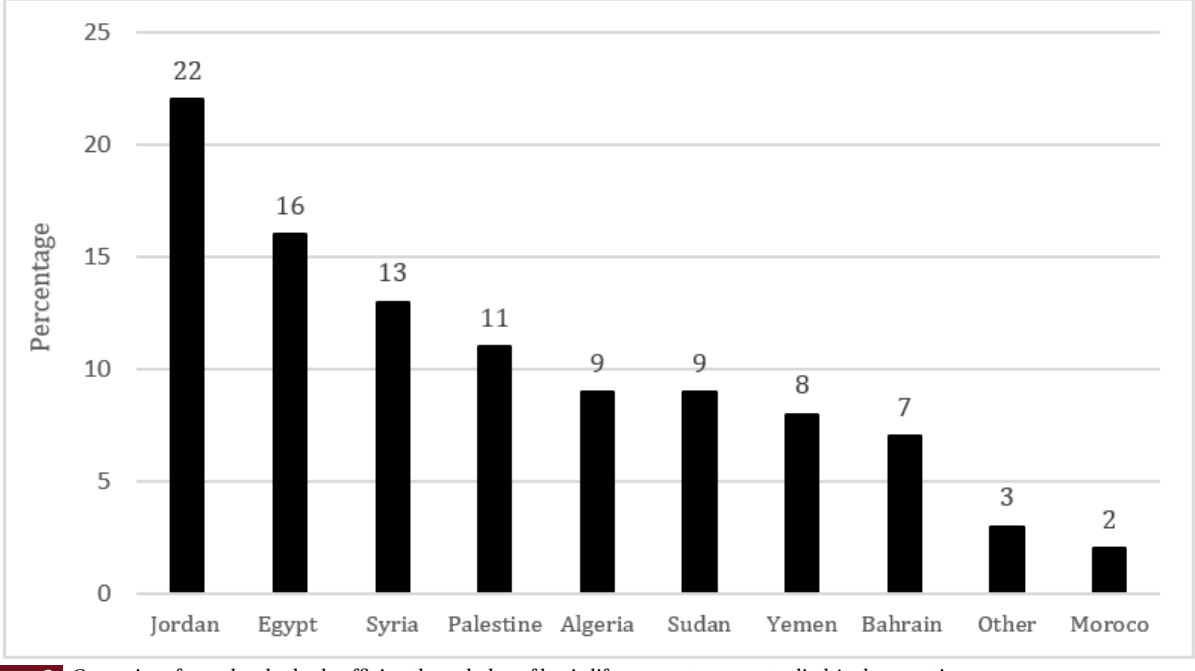

Figure 2: Countries of people who had sufficient knowledge of basic life support among studied Arab countries.

Supplementary Table 1: English version of the questionnaire

PART ONE: Socio-Demographic and General Information
Q1. Age ————
Q 2. Gender 1. Male 2. Female
Q3. Residence? 1. Urban 2. Rural
Q4. Educational status 1. No formal education 2. Formal education
Q 5. Marital status? 1. married 2. Single 3. Widowed 4. Divorced
Q6. Religious? 1. Muslim 2. Christian 3. Jewish 5. Others
Q 7. Did you take basic life support training before? 1. Yes 2. No
Q8. Type of training? 1. Theoretical training 2. Practical training 3. Both
Q9. The number of training sessions before? 1. One 2. Two 3. Three or more
Q10. If your answer to question no - 9 'is yes, 'where were you trained?
Q11. Did you hear about basic life support? 1. Yes 2. No
Q12. If yes, for Q-11 source of information? 1. Reading materials 2. Media 3. Health professionals 4. Friends and relatives
Q13. Did you get an emergency case that needs basic life support? 1. Yes 2.No
PART TWO: Knowledge Questions
Q1. When should basic life support be given during an accident? 1. Immediately 2. In Hospital. 3. I don't know
Q2. Who should give basic life support during an accident?
1. Health care worker 2. Community policy 3. Scene bystanders including Community. 4. I don't know
Q3. Is being unconscious a sign of cardiac arrest? 1. Yes 2. No 3. I don't know
Q4. If you answered yes for Q-3, how can you have recognized unconsciousness?
1. No reaction to voice 2. No reaction to touch 3. No movements 4. Don't know
Q5. Is the absence of breathing a sign of cardiac arrest? 1. Yes 2. No
Q6. If you yes for Q-5, how can you recognize the absence of breathing?
1. No breathing moves 2. No breathing sound 3. No expired air 4. Mirror in front of victim's mouth 5. Don't know
Q7. Is the absence of circulation a sign of cardiac arrest? 1. Yes 2. No
Q8. If Yes for Q-7, how can you recognize absence of circulation?
1. Palpation of neck arteries 2. Palpation of arm arteries 3. I don't know
Q9. Moving patients from accident sites is a component of basic life support 1. Yes 2. No 3. I don't know
Q10. Stopping bleeding is a component of basic life support. 1. Yes 2. No 3. I don't know
Q11. Applying to splint for fractures is a component of basic life support 1. Yes 2. No 3. I don't know
Q12. Communicate to emergency medical service -939 is a component of basic life 1. Yes 2. No 3. I don't know
Q13. Transporting patients to hospitals is a component of basic life support 1. Yes 2. No 3. I don't know
Q14. Noisy breathing is a sign of airway problem for the victim 1. Yes 2. No 3. I don't know
Q15. Fast breathing is a sign of an airway problem for the victim 1. Yes 2. No 3. I don't know
Q16. Slow breathing is a sign of airway problem for the victim 1. Yes 2. No 3. I don't know
Q17. No breathing is a sign of an airway problem for the victim 1. Yes 2. No 3. I don't know
Q18. Jaw thrust is a procedure used to open the airway of victims 1. Yes 2. No 3. I don't know
Q19. Head tilt and chin left is a procedure used to open the airway for accident victims 1. Yes 2. No 3. I don't know
Q20. Mouth to mouth is used for giving breath 1. Yes 2. No 3. I don't know
Q21. The mouth to the nose is used for giving breath 1. Yes 2. No 3. I don't know
Q22. Keep the person's neck and back straight with your hand while shifting a patient to the hospital, a thing you should always assume if the cervical injury is present 1. Yes 2. No 3. I don't know
Q23. Keep the person's neck and back straight with a hardboard while shifting a patient to the hospital, a thing you should always assume if the cervical injury is present 1. Yes 2. No 3. I don't know
Q24. If there is only a limb injury, the patient is transferred in a sitting position while shifting a patient to the hospital, a thing you should always assume if the cervical injury is present 1. Yes 2. No 3. I don't know
Q25.Bleeding from the injured site is a sign of hemorrhage 1. Yes 2. No 3. I don't know
Q26.Victim becoming collapse is the sign of bleeding from the injured site 1. Yes 2. No 3. I don't know
Q27.Weak and Fast pulse and increased respiratory rate is the sign of bleeding from the injured site 1. Yes 2. No 3. I don't know
Q28.Applying tourniquet is important to stop bleeding 1. Yes 2. No 3. I don't know
Q29. Applying pressure and pressing are important to stop bleeding 1. Yes 2. No 3. I don't know
Q30. Lifting the injured part above the body level is important to stop bleeding. 1. Yes 2. No 3. I don't know

Table 2: The mean knowledge score of participants regarding basic life support (BLS) based on different socio-demographic variables (N=4465)

Variables	Values	P-value
Age (years)		
18-24	17.38 ± 5.22	<0.001
25-34	18.25 ± 5.30	
35-44	17.53 ± 5.23	
45-54	18.03 ± 4.86	
55-64	18.42 ± 4.70	
≥65	17.25 ± 4.58	
Gender		
Female	17.54 ± 5.06	<0.026
Male	17.97 ± 5.35	
Rather not say	17.63 ± 7.48	
Residency		
Urban	17.86 ± 5.19	<0.001
Rural	17.13 ± 5.24	
Education		
University degree	17.77 ± 5.20	<0.222
Secondary education	17.22 ± 5.08	
Master	17.96 ± 5.17	
Professional diploma	17.32 ± 7.11	
Primary education	19.29 ± 6.36	
Other	18.20 ± 3.74	
PhD	19.56 ± 5.21	
High school	19.60 ± 3.20	
Marital Status		
Single	17.62 ± 5.22	<0.272
Married	17.89 ± 5.19	
Widowed	17.65 ± 4.77	
Country		
Jordan	17.12 ± 4.92	<0.001
Yemen	19.86 ± 4.71	
Egypt	16.32 ± 5.55	
Sudan	18.60 ± 4.90	
Syria	16.79 ± 5.00	
Palestine	17.33 ± 5.36	
Bahrain	18.74 ± 5.53	
Algeria	17.68 ± 4.52	
Other	16.82 ± 5.45	
Morocco	14.15 ± 5.10	
Job Status		
Employed	17.42 ± 5.31	<0.001
Entrepreneur/freelancer	17.32 ± 5.34	
Student	17.26 ± 5.21	
Health-sector employee	20.27 ± 4.28	
Unemployed	16.88 ± 5.02	
Retired	17.48 ± 4.13	
Other	18.32 ± 2.15	
BLS training		
No	16.96 ± 5.27	<0.001
Yes	20.11 ± 4.20	
Training Type		
Both	20.57 ± 3.95	<0.001
Theoretical training	19.07 ± 4.49	
Practical training	19.36 ± 4.63	
Sessions of training		
Three or more	20.68 ± 4.13	
One	19.77 ± 4.30	
Two	19.70 ± 4.04	
Heard about BLS before		
No	16.25 ± 5.41	<0.001
Yes	19.35 ± 4.43	
BLS information source		
Health professionals	20.12 ± 3.91	<0.001
Media	18.18 ± 4.99	
Reading materials	20.09 ± 4.10	
Friends and relatives	18.46 ± 4.35	
Facing a person in need of BLS		
No	17.19 ± 5.32	<0.001
Yes	18.92 ± 4.71	

Data are presented as mean ± standard deviation.

Table 3: Linear logistic regression analysis of the independent predictive factors regarding knowledge of basic life support among the studied participants

Variables	Coefficient	95 % CI		P value
		Lower	Upper	
Information source				
Friends and relatives	2.0545	1.407	2.702	<0.001
Health professionals	2.6418	2.148	3.136	<0.001
Age (year)				
18-24	16.1967	15.946	16.447	<0.001
25-34	16.6735	16.342	17.005	<0.001
35-44	16.4983	16.051	16.945	<0.001
45-54	17.0346	16.463	17.606	<0.001
55-64	17.2053	16.282	18.129	<0.001
Reading materials	3.3382	2.817	3.860	<0.001
Training mode	1.9145	1.419	2.410	<0.001

Data are presented with 95% confidence interval (CI).