# An Evaluation of Maltese Radiographers' Awareness on Adult Basic Life Support Guidelines

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*Abstract: This study provides insight into the level of awareness concerning adult Basic Life Support amongst a sample of Maltese radiographers. The first aim of this study was to determine whether these radiographers were updating themselves on changes occurring within the European Resuscitation Council Guidelines for Resuscitation. The second aim was to evaluate the radiographers' level of awareness in adult BLS in relation to Sudden Cardiac Arrest.*

*A cross-sectional, non-experimental research design was adopted, involving a stratified sample of 25 qualified radiographers. Data were collected via a self-designed, semi-structured questionnaire. Quantitative data obtained from closed-ended questions were organised manually and analysed by means of descriptive statistics. A mean percentage score representing radiographers' level of awareness in adult basic life support was calculated, based on responses to 14 questions.*

*The study indicated that 75% of the respondents did not keep themselves updated on changes within the European Resuscitation Council Guidelines throughout the years of their radiography career. Moreover, the mean percentage score obtained on questions testing the radiographers' awareness of adult basic life support was found to be 43%.*

*Findings suggest that continuing professional education and hands-on training are highly recommended for radiographers to enhance their current level of awareness of adult basic life support.*

*Keywords: Resuscitation, Awareness, Health Care Professionals, Basic Life Support, Sudden Cardiac Arrest.*

## Introduction:

Sudden Cardiac Arrest (SCA) is a condition in which the heart suddenly and unexpectedly stops beating effectively following an irregular heart rhythm. Subsequently, a SCA victim becomes unconscious since oxygenated blood flow to the brain, lungs and other vital organs is hindered. SCA is known to be a major cause of mortality in Europe, affecting around 350,000 individuals per year[1]. Without rapid action, SCA may cause death within four to eight minutes of collapse. However, it can be reversed successfully through initiation of the chain of survival, mainly early intervention with cardiopulmonary resuscitation (CPR), defibrillation and advanced cardiac life support. In fact, it has been established that survival rates as high as 49% to 75% are possible if CPR and automated external defibrillation (AED) are provided within three to five minutes of collapse[2].

Poor awareness and skill retention following Basic Life Support (BLS) training amongst allied health care professionals has been documented over the past 10 years [3-6]. In reality, life support procedures may be

strongly associated with the role of the physician or the nurse, since cardiac-related emergencies are by far more frequently encountered by the latter than by radiography staff. However, in the radiology department, radiographers are most likely to be accompanying patients in the instance of collapse. Therefore, it is vital that they immediately recognise the symptoms of SCA and start the chain of survival promptly, considering the fact that first responders have the greatest opportunity to provide a successful outcome for a SCA victim.

Indeed, BLS is a competency addressed in the final year of the undergraduate radiography programme offered in Malta. In addition, Maltese radiographers are provided with the opportunity to attend local BLS refresher courses from time to time. Moreover, the European Resuscitation Council (ERC) evaluates its Guidelines for Resuscitation every five years, and makes recommendations for change in response to new evidence strengthening that already available. Consequently, the present study aimed to determine whether Maltese radiographers were updating themselves on changes within the ERC Guidelines for Resuscitation. It also aimed to evaluate qualified radiographers' awareness of adult BLS in relation to SCA.

## Materials & Methods:
### *The research tool:*
A semi-structured questionnaire comprising a mixture of closed- and open-ended questions was designed by the authors on the basis of a preliminary literature review. Questions related to adult BLS techniques were formulated using the 2010 version of the ERC Guidelines for Resuscitation as a gold-standard, international referencing source. The semi-structured questionnaire consisted of seven sections amounting to a total of 28 questions. Sections 1 to 3 (questions 1 to 10) addressed respondents' academic and occupational backgrounds, previous training in BLS, as well as adult BLS encounters. Sections 4 to 7 (questions 11 to 28) tested awareness of the definition, clinical signs and risk factors of SCA, the in-hospital adult resuscitation sequence, adult CPR, specifically relating to optimal chest compression technique and compression-to-ventilation ratio, as well as defibrillation.

### *Pilot study:*
Since the study was small in scale, a pilot study was carried out on a sample limited to three qualified radiographers. These professionals were selected at random from the accessible population and were later excluded from the actual study. The main purpose of the pilot study was to determine the time needed for respondents to complete the questionnaire and for responses to be analysed. The pilot study participants were asked to complete the questionnaire anonymously. The respondents were also probed on the general structure of the questionnaire. Some questions were subsequently re-phrased to ensure maximum readability and clarity.

### *Validity and reliability:*
In order to ensure the tool's content validity, questions were formulated on the basis of a review of current literature. Content validity, in terms of adequacy of the questions, was then ascertained by asking three resuscitation experts to rate the relevance of all questions using a four-point scale (1 = Not relevant; 2 = Somewhat relevant; 3 = Quite relevant; 4 = Very relevant). The majority of questions were rated as Very relevant or Quite relevant by the three specialists, hence producing an acceptable Content Validity Index (CVI) of 0.92. This ensured that questions included in the questionnaire adequately captured all concepts being investigated in the research study[7].

Reliability was addressed in the form of stability. Due to time constraints, a test-retest procedure having a one-week time interval was employed with two randomly selected radiographers. On both occasions, the majority of questions were answered in a similar manner by the respondents. A favourable reliability coefficient of 0.89 was obtained, indicating that the research tool was not affected by any extraneous factors.

### *Data collection and analysis:*
Data were collected over a period of 10 days via the distribution of a total of 25 questionnaires. Twenty completed questionnaires were returned, resulting in a relatively high response rate of 80%. A scoring system

was created whereby each respondent was allocated points for each correct answer to the closed ended questions 15 to 28. In the case of question 18, which involved sequence listing, respondents were allocated one point for every action put in the correct order. No negative marking was used. The respondents' mean percentage score was calculated by dividing the sum of all the given elements by the total number of elements and multiplying by 100. Since the purpose of this study was to quantify awareness based on the number of correct responses, "do not know" answers and blank responses were grouped together within the incorrect responses category. Quantitative data obtained from closed-ended questions were then analysed by means of descriptive statistics. For the purpose of clarity, all reported percentage figures have been rounded up to the nearest integer.

### Ethical considerations:

Approval to conduct this research study was obtained from the University of Malta Research Ethics Committee, after permission to distribute questionnaires to radiographers was granted by the Manager of Radiography Services at the state general hospital. A recruitment letter, which also served as a consent form, was attached to the questionnaire circulated among participants in order to explain the nature of the study to the participants, and gain their informed consent. Anonymity and confidentiality were maintained by not requesting any identifying information on the documents circulated among the participants and by presenting the option of returning the completed questionnaire anonymously in a sealed, collection box.

## Results & Discussion:

### Participants

The target population consisted of 101 qualified, diagnostic radiographers working in a Maltese state general hospital during February 2012. A total of six radiographers occupying a managerial position were excluded from the study as the authors wanted to gain insight from those professionals who were in direct contact with patients. Five other radiographers who were later involved in the piloting and reliability testing of the research tool were also excluded. Stratified random sampling according to work setting was used to select participants in a precise categorical manner. Out of a target population of 91 radiographers, a stratified sample of 25 qualified radiographers was randomly chosen in proportion to the percentage of radiographers working in the various radiographic areas within the Medical Imaging Department of the state general hospital. Radiographers whose names were randomly drawn were asked to participate in the study. To counteract a low response rate, two of the selected radiographers who preferred not to participate were replaced by another two randomly selected participants. The final sample was recruited from the following areas within the hospital's Medical Imaging Department: Accident and Emergency ($N = 5$), Angiography ($N = 1$), Cardiac Catheterisation ($N = 2$), Computed Tomography ($N = 3$), General Radiography ($N = 5$), Magnetic Resonance Imaging ($N = 2$), Mammography ($N = 1$), Nuclear Medicine ($N = 1$), Theatre and Mobile Radiography ($N = 4$) and Ultrasound ($N = 1$).
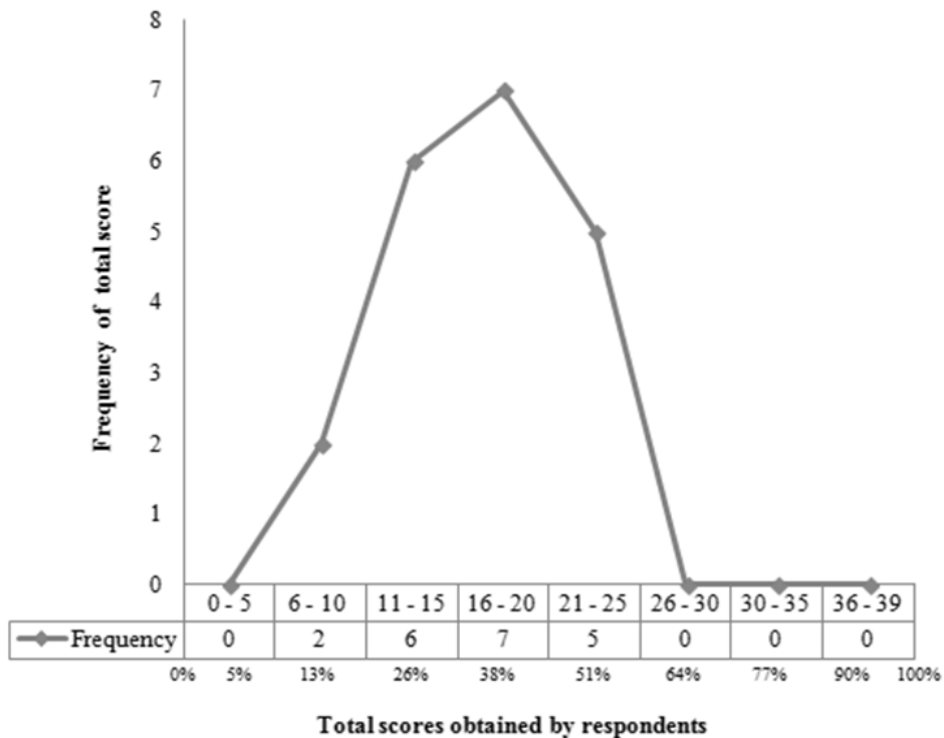
The classification of the 20 respondents by length of working experience in radiography was as follows: less than 1 year: 0%, 1-3 years: 35%, 4-6 years: 20%, 7-10 years: 15%, 11 years and over: 30%. Descriptive statistics regarding respondents' reported updates on changes within the ERC Guidelines on Resuscitation are presented in *Figure 1* overleaf.

**Figure 1: Respondents' reported updates on changes within the European Resuscitation Council (ERC) Guidelines for Resuscitation (2010)**
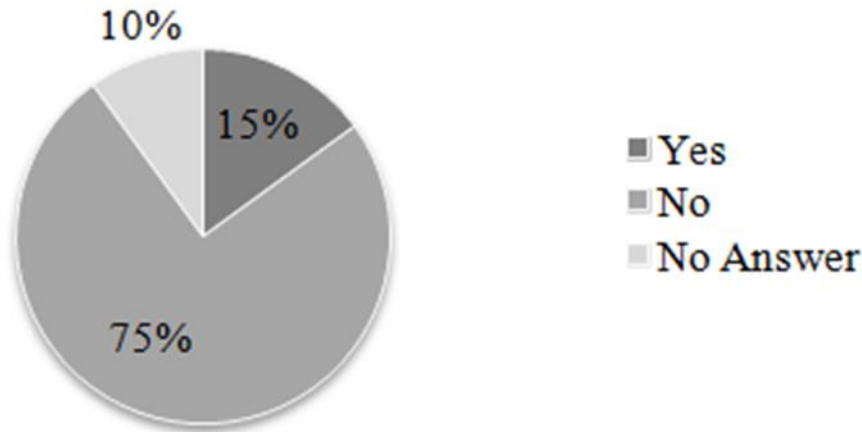


A frequency distribution curve relating to the total scores obtained by respondents in questions testing awareness and recognition of the causes, risk factors and clinical signs of SCA, adult resuscitation sequence, adult CPR and adult defibrillation is presented in *Figure 2* below. Based on the total number of correct questionnaire responses, the mean percentage score related to respondents' awareness of adult BLS in relation to SCA was 43%.

**Figure 2: The frequency distribution of adult Basic Life Support (BLS) awareness total scores obtained by respondents in questions testing awareness of adult BLS in relation to Sudden Cardiac Arrest (SCA)**



| | 0 - 5 | 6 - 10 | 11 - 15 | 16 - 20 | 21 - 25 | 26 - 30 | 30 - 35 | 36 - 39 |
|---|---|---|---|---|---|---|---|---|
| Frequency | 0 | 2 | 6 | 7 | 5 | 0 | 0 | 0 |

Total scores obtained by respondents

*Updates on the European Resuscitation Council (ERC) Guidelines for Resuscitation:*
While it seems reasonable to assume that all health care professionals are following latest European resuscitation protocols, 15 out of the 20 respondents in this study (75%) reported that they did not take the initiative to keep themselves updated on changes within the ERC Guidelines for Resuscitation throughout the years of their radiography career. It is of further concern that 13 respondents (65%) had encountered an adult patient necessitating the administration of BLS throughout the course of their work experience in the general state hospital. In these cases, BLS was administered by the resuscitation team. Reasons given by the respondents for not keeping themselves updated on changes within the ERC Guidelines for Resuscitation included time or workload constraints (33%) and not having the right opportunity to do so (13%). Such responses were provided despite the fact that a free downloadable copy of the latest ERC Guidelines for Resuscitation can be obtained online via the ERC official website. Moreover, four respondents (27%) did not deem BLS to be part of the radiographer's role, stating that it should be provided by more experienced hospital personnel. However, Nolan et al. (2010) stated that the best survival outcomes for in-hospital cardiac arrests were reported in cases where BLS was initiated by whoever was in the room with the SCA victim at the time of collapse, to be handed over to more experienced personnel, such as the resuscitation team members, when they arrived on site.

*Awareness of adult Basic Life Support (BLS) in relation to Sudden Cardiac Arrest (SCA):*
From the sample of 20 respondents, the lowest BLS total awareness percentage score obtained was 23% (9 correct answers out of 39) whilst the highest score was 62% (24 correct answers out of 39). Overall, the highest scores were registered from respondents who claimed that they had attended BLS training sessions following employment in the state general hospital. However, determining whether this relationship was statistically significant was not possible due to the small sample size. However, this observation is consistent with findings from similar studies, whereby health care staff such as nurses or doctors who previously attended BLS courses to refresh their awareness, scored significantly better on questions testing awareness compared to those who did not (Olivetto de Almeida et al., 2011; Passali et al., 2011).

The mean BLS total awareness score on questions testing the awareness of adult BLS in relation to SCA was 43%. This finding compares well to others reported in two small-scale studies having a similar research design by Olivetto de Almeida et al. (2011) and Marzouq and Lyneham (2009). In these studies, the mean scores obtained for questions testing awareness of BLS amongst nurses were 42% and 52% respectively. Moreover, findings from the present study are consistent with those reported in a large-scale study amongst nurses and physicians employed in five different hospitals in Athens, Greece, which showed Greek doctors' and nurses' BLS awareness to be sub-optimal, with some of them displaying dangerous deficiencies (Passali et al., 2011).

*Limitations:*
Due to time constraints and lack of resources, the authors opted to conduct a small-scale study. Thus, no power analysis was conducted to determine the representativeness of the recruited sample. Nonetheless, this study's findings should not be generalised since they are based on a small, stratified random sample of radiographers that represented approximately 22% of the target population. Moreover, as a result of the small sample size, inferential statistical analyses were not performed.

## Conclusions & Recommendations:
Main findings from this study suggest that Maltese radiographers in a small, stratified random sample did not keep themselves updated on the ERC Guidelines for Resuscitation. Moreover, the mean score obtained on questions testing awareness of adult BLS was found to be 43%. These findings indicate the need for continuing professional education and hands-on training in order to make high quality resuscitation available to all patients, while providing the best possible chances of survival to those suffering from SCA inside the state general hospital.

Owing to the study's relatively small sample, as well as limited piloting and testing of the research tool, results from this study are to be treated with caution and should not be generalised in any way. Nonetheless, to the authors' knowledge, this is the first study investigating qualified radiographers' awareness of BLS in Malta. Therefore, findings from this study are novel to the Maltese context and provide insightful indications which could be a source for further research in this field. Replication of this study on a larger scale is recommended as this would promote further statistical analyses and enable generalisation of the results.

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**A Brief Author Biography**

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