

Assessment of Knowledge of BLS amongst MDS students in a teaching institute

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Abstract:

Basic life support which was invented in 1960 is essential during cardiopulmonary resuscitation. In India, the research on knowledge regarding basic life support amongst dental students, dental specialists and staff is deficient. The objective of this study was to assess and compare the knowledge about basic life support amongst 2nd and 3rd year MDS students. The authors conducted a questionnaire study to compare and assess the knowledge of Basic Life Support in 2nd and 3rd year MDS students. The questionnaire was formulated after a thorough literature search. The questionnaire was validated and then sent to the students and the data was recorded and analyzed.

It was found that the second years (N= 42) had low knowledge scores compared to the third years (N= 45). Out of the nine branches, participants belonging to the pedodontics department had the lowest score whereas those belonging to endodontics department had the highest score. The study concluded that 3rd year MDS students had better knowledge about Basic Life Support than the 2nd year MDS students. However, the residents of oral and maxillofacial surgery had higher knowledge compared to the other branches.

Keywords: Cardiopulmonary Resuscitation, Dental students, Health survey, Questionnaire

1.Introduction:

Basic life support (BLS) is a part of cardiopulmonary resuscitation (CPR) (Berg RA et al 2010). Invented in 1960, CPR is a simple but effective procedure that allows almost anyone to sustain life in the early critical minutes after cardiac and respiratory arrest. BLS includes both prompt recognition and immediate support of ventilation and circulation in case of respiratory or cardiac arrest (Berg RA et al 2010). It has a combination of skills including support to ventilation and chest compression to normalize blood circulation to the brain and vital organs. Knowledge of BLS and practice of simple CPR techniques ensures the survival of the patient long enough till experienced medical help arrives and in most cases is itself sufficient for survival. Proper practice of the techniques and manoeuvres enables a person to effectively resuscitate a victim. Ideally, everyone should know BLS and CPR but its awareness to medical personnel is invaluable. Newly qualified doctors are expected to take part in resuscitation from their first day (Berg RA et al 2010).

BLS is most effective if begun immediately after cardiac arrest has occurred. If cardiac arrest continues for 10 minutes or more, survival is highly unlikely, and if the victim survives it is extremely unlikely that the victim's central nervous system will be restored to its precardiac arrest status. In their study of

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unsuccessful resuscitation attempts, Gray et al found improved outcome with a total resuscitation time (collapse to recovery) of less than 15 minutes, confirming the ineffectiveness of prolonged resuscitation (**Gray WA, Capone RJ, Most AS, 1991**). Induction of therapeutic hypothermia has been shown to improve survival and functional outcome. Practical methods of rapidly inducing hypothermia include: ice packs (applied to the neck, inguinal areas, and axilla), fan cooling of dampened exposed skin, and cooling blankets underneath and on top of the patient.

In the dental office environment, BLS should be started on all victims of cardiac arrest.

Once started, CPR should be continued until one of the following occurs: (1) the victim recovers, demonstrating adequate spontaneous respiratory exchange and circulation; (2) a second rescuer, equally well trained in BLS, becomes available to assist or take over the efforts of the first rescuer; (3) a physician arrives and assumes overall responsibility; (4) EMS personnel arrive and stabilize and transfer the victim to an emergency care facility that is able to provide advanced life support; or (5) the single rescuer becomes exhausted and is physically unable to continue with resuscitation. This last option is unlikely to occur in the dental office environment (**Malamed SF, 2014**).

2. Significance Of The Study

Proper practice of the techniques and manoeuvres is essential to effectively resuscitate a victim, which requires adequate knowledge and training during the dental education years. A study in Bulgaria by (Stoeva I) revealed that though 73% of dental students were self-confident that they will recognize the emergent problem quickly, but severe lack of practical skills was observed (**Stoeva I, 2011**). On the other hand, study by (Chandrasekaran et al) revealed that the study group comprising of medical, dental, nursing students and faculty in a city in Tamil Nadu, India were severely lacking in the awareness of BLS (**Naram A, Duraisamy R, 2019**).

In India, very little data are present which addresses the awareness of the dental personnel including students, doctors, and paramedical staff regarding this highly effective and easy manoeuvre. Such studies will be useful to understand the prerequisites for forming guidelines in this regard.

The objective of this study was to determine the level of awareness regarding BLS and knowledge of involved skills among postgraduate students of dental profession in a dental college and hospital.

3.Objectives:

1. To assess knowledge about basic life support amongst 2nd year Post Graduate students in a teaching institute in Pune, Maharashtra
2. To assess knowledge about basic life support amongst 3rd year Post Graduate students in a teaching institute in Pune, Maharashtra
3. To compare between the knowledge about basic life support amongst 2nd year Post Graduate students and 3rd year Post Graduate students in a teaching institute in Pune, Maharashtra

4.Hypotheses of the study:

Thus the purpose of this study was to assess the knowledge of basic life support amongst 2nd year MDS students and 3rd year MDS students in a teaching institute in Pune, Maharashtra.

5. Sample size derivation

The 2nd year and 3rd year post graduate students of our institute were the study population. The investigators used convenience sampling technique and included all ninety 2nd and 3rd year post graduate students, but two students failed to report. Thus, the final sample for this study was 88 students.

6. Material and Methods:

This was a prospective cross-sectional study conducted from 2019 to 2020. A total of 88 Post graduate students participated in the study. A self-explanatory questionnaire consisting of 10 questions were prepared to assess the knowledge of BLS among the 2nd year and 3rd year post graduate students. Face and content validity was done for the questionnaire. Before commencing, the study was presented before the Institutional Ethics committee (IEC) and ethical clearance was obtained. The participants were explained about the importance of the study and a valid written informed consent was obtained before filling the questionnaire. The questionnaire contained the Name of the student, year of post-graduation and the department name. The questionnaire consisted of the following questions:

Table 1. Questionnaire

| | |
|--|--|
| General information: | |
| a) | Name: |
| b) | Department: |
| c) | Year: |
| 1. Have you heard about BLS/? | |
| Yes | No |
| 2. Full form of AED? | |
| | <ul style="list-style-type: none"> • Automated external defibrillator. • Automatic external defibrillator. • Automated external device. • Automatic external device. |
| 3. What is the number to be called in case of emergency? | |
| | <ul style="list-style-type: none"> • 100 • 121 • 108 • 104 |

| |
|---|
| |
| 4. Have you had previous BLS training? Yes No |
| 5. Do you want more BLS training? <ul style="list-style-type: none">• Yes• No• I don't know |
| 6. Do you think BLS training should be mandatory in the curriculum? <ul style="list-style-type: none">• Yes• No• I don't know |
| 7. If you had no BLS training outside of college, what was the reason? <ul style="list-style-type: none">• I think it's not important• Busy schedule• Not interested• Cost of the course• No answer |
| 8. Correct sequence of resuscitation in BLS is: <ul style="list-style-type: none">• Compression, airway, breathing.• Airway, Breathing, compression.• Breathing, airway, compressions. |
| 9. Which artery to be felt for a pulse in an adult patient? <ul style="list-style-type: none">• Carotid artery• Femoral artery• Branchial artery |
| 10. What is the correct depth of compressions for |

| |
|--|
| <p>Adults is</p> <ul style="list-style-type: none">• 5-6 cm• 4-5 cm• 6-7cm• 2-4cm |
| <p>11. The correct ratio of chest compressions to rescue breaths are</p> <ul style="list-style-type: none">• 30:2• 15:2• 30:1• 25:2 |
| <p>12. What should be the number of breaths/ minutes?</p> <ul style="list-style-type: none">• 10-12• 12-14• 16-18• 20-25 |
| <p>13. Knowledge of external cardiac massage per minute during BLS:</p> <ul style="list-style-type: none">• Know• Does not know <p>14. Knowledge of location for chest compression while delivering BLS:</p> <ul style="list-style-type: none">• Know• Does not know |
| <p>15. For how long the pulsation should be checked:</p> <ul style="list-style-type: none">• 5-10 seconds• 15-20 seconds• 30-40 seconds |

7. Statistical techniques used

The questionnaire to assess awareness of Basic life support was developed by the investigators (SL). Face and content validation was done for the same. Data was analysed using IBM SPSS v.20. Descriptive analysis was done in the form of percentages. Chi-square test was done to find the association of the knowledge score with MDS year and MDS branch of the participants. Unpaired t-test and one way ANOVA was done to compare the mean knowledge score with respect to MDS year and MDS branch respectively

8. RESULT:

A total of 87 subjects participated in the study. Out of 87 participants 48.3% belonged to 2nd year MDS and 51.7% belonged to 3rd year MDS. 27.1% were from Orthodontics department, 27.6% from Prosthodontics department, 34.6% from Endodontics department, 29.9% from Pedodontics department, and 32.3% from Oral surgery department, 4.6% from Public health dentistry department, 13.8% from Oral medicine and Radiology department, 25.4% from Periodontics department and 4.8% from Oral pathology department.

The knowledge scores of MDS students belonging to different MDS branches were compared. In the low knowledge category, a total of 3 students hailed from the orthodontics department, 3 from prosthodontics department, 3 from the endodontics department, 4 from the pedodontics department, 1 from PHD department, 1 from Oral medicine and Radiology department, 3 from periodontics department whereas there were no students from the oral surgery and oral pathology department.

Table 2: Distribution of participants according to the branch of MDS and the year of post-graduation

| MDS Branch | II MDS | | III MDS | |
|--------------------------------|--------|------|---------|------|
| | N | % | N | % |
| Orthodontics | 3 | 7.1 | 9 | 20 |
| Prosthodontics | 6 | 14.3 | 6 | 13.3 |
| Endodontics | 8 | 19 | 7 | 15.6 |
| Pedodontics | 6 | 14.3 | 7 | 15.6 |
| Oral surgery | 7 | 16.7 | 7 | 15.6 |
| Public Health dentistry | 1 | 2.4 | 1 | 2.2 |
| Oral Medicine | 3 | 7.1 | 3 | 6.7 |
| Periodontics | 6 | 14.3 | 5 | 11.1 |
| Oral Pathology | 2 | 4.8 | 0 | 0 |
| Total | 42 | 48.3 | 45 | 51.7 |

In the moderate knowledge category, a total of 4 students hailed from the orthodontics department, 1 from prosthodontics department, 2 from the endodontics department, 1 from the pedodontics department, 5 from the oral surgery department, 1 from PHD department, 2 from Oral medicine and Radiology department, 3 from periodontics department and 2 from the oral pathology department.

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In the high knowledge category, a total of 5 students hailed from the orthodontics department, 8 from prosthodontics department, 11 from the endodontics department, 8 from the pedodontics department, 9 from the oral surgery department, 3 from Oral medicine and Radiology department, 5 from periodontics department whereas there were no students from the PHD and oral pathology department. (Table 1)

It was found that the second years (N= 42) had low knowledge scores compared to the third years (N= 45). The difference was statistically significant (p value = 0.007). Out of the nine branches, participants belonging to the pedodontics department had the lowest score whereas those belonging to endodontics department had the highest score. The difference was not statistically significant (p value = 0.205).(Table 2)

TABLE 3: Comparison of the knowledge categories of MDs students belonging to different MDS branches

| MDS Branch | MDS Year | Knowledge category | | | MDS year p-value | MDS Branch p-value |
|-------------------------|----------------------|--------------------|---------------------|------------------|------------------|--------------------|
| | | Low (0-4) N | Moderate (5-7) N | High (8-10) N | | |
| Orthodontics | 2 nd year | 1 | 1 | 1 | 0.007* | 0.205 |
| | 3 rd year | 2 | 3 | 4 | | |
| Prosthodontics | 2 nd year | 3 | 0 | 3 | | |
| | 3 rd year | 0 | 1 | 5 | | |
| Endodontics | 2 nd year | 2 | 0 | 6 | | |
| | 3 rd year | 0 | 2 | 5 | | |
| Pedodontics | 2 nd year | 4 | 0 | 2 | | |
| | 3 rd year | 0 | 1 | 6 | | |
| Oral surgery | 2 nd year | 0 | 3 | 4 | | |
| | 3 rd year | 0 | 2 | 5 | | |
| Public Health dentistry | 2 nd year | 1 | 0 | 0 | | |
| | 3 rd year | 0 | 1 | 0 | | |
| Oral Medicine | 2 nd year | 1 | 1 | 1 | | |
| | 3 rd year | 0 | 1 | 2 | | |
| Periodontics | 2 nd year | 2 | 1 | 3 | | |
| | 3 rd year | 1 | 2 | 2 | | |
| Oral Pathology | 2 nd year | 0 | 2 | 0 | | |

It was found that the third year MDS students had a significantly higher mean knowledge score (8.00 ± 2.1) compared to the second year MDS students (6.45 ± 3.4) (p value = 0.013). (Table 3)

TABLE 4: Comparison of the mean knowledge scores of the MDS Students with respect to their academic year

| MDS year | N | Mean | Std. Deviation | p-value |
|----------|----|------|----------------|---------|
| II MDS | 42 | 6.45 | 3.451 | 0.013* |
| III MDS | 45 | 8.00 | 2.164 | |
| Total | 87 | 7.25 | 2.946 | |

When the mean knowledge score was compared with respect to the MDS branch, the difference was not statistically significant (p value = 0.708). (Table4)

TABLE 5: Comparison of mean knowledge scores of the MDS Students with respect to their MDS Branch

| MDS Branch | N | Mean | Std. Deviation | p-value |
|-------------------------|----|------|----------------|---------|
| Orthodontics | 12 | 6.75 | 2.8 | 0.708 |
| Prosthodontics | 12 | 7.42 | 3.65 | |
| Endodontics | 15 | 8.07 | 2.60 | |
| Pedodontics | 13 | 6.69 | 3.47 | |
| Oral surgery | 14 | 8.21 | 2 | |
| Public Health dentistry | 2 | 5 | 1.41 | |
| Oral Medicine | 6 | 7.33 | 2.94 | |
| Periodontics | 11 | 6.45 | 3.56 | |
| Oral Pathology | 2 | 6.5 | 0.70 | |

P-value non-significant, calculated using one way ANOVA.

9.DISCUSSION

It is found that cardiac arrest is the most leading cause of death in the developing as well as developed countries. It is a life-threatening event and should receive an intervention immediately. Road traffic accidents followed by cardiac arrest are common in the area of Pimpri-Chinchwad due to less use of helmets by bikers and drivers of two wheelers.

The present study assessed the knowledge of 2nd year and 3rd year post-graduate MDS students regarding basic life support. It was found that the second years had low knowledge scores compared to the third years. The difference was statistically significant.

It was found that medical emergencies are common in dentistry. In the study conducted by Muller et al which was carried out for a year, about two-thirds of dentists encountered at least one emergency (Müller MP et al 2008). Treatments like conventional or surgical extraction of third molars, root canals, or other dental procedures can elicit cardiac arrest in some patients due to anxiety or any underlying disease. The constant administration of local anaesthetics and other drugs, use of certain dental materials, medically compromised patients, the fear and anxiety of unknown surgical operations

in many patients are common causes of emergency situations (**Subramaniam S, Neelakantan P,2013**).

It is imperative for various dental specialists to have a sound knowledge of BLS to ensure safety of the patients if and when the need arises on the dental chair following a certain dental procedure. According to the DCI curriculum (2017) for MDS students, the dental specialists are expected to have the knowledge of basic life support. Ideally, dental colleges or universities should conduct lectures and hands on Basic Life Support to educate the undergraduate students, post graduate students and the teaching and non-teaching staff.

So, this study was designed to assess the knowledge of post-graduate students in our dental college about BLS. A questionnaire was designed to assess the same. Among 91 students, one didn't participate as he left the course, while two students refused to participate.

The result of our study showed that the 3rd year post graduate students had more knowledge compared to the 2nd years. Out of the 9 branches, it was found that the knowledge score of the students belonging to the oral and maxillofacial surgery department was high. The reason might be that, the residents of oral and maxillofacial surgery department are well aware and equipped with the knowledge to handle such cases. The knowledge score of students belonging the department of pedodontics was found to be low as they have less awareness and exposure regarding such cases. Overall, it was found that the 3rd year MDS students had better knowledge compared to the 2nd year MDS students as they have been trained thrice as the college arranges a BLS training workshop every year for all the students.

Similar findings were noted by Narayan et al where the interns and post graduate students both had average knowledge (**Malamed SF,2014**).

But the study by authors Sahiti Reddy, Hashen Motabir, Ohoud Alotaibi showed that the undergraduates had better knowledge compared to the post graduate students and staff (**Jodalli PS, Ankola AV ,2012; Roshana S Naram A, 2012; ReddyS,2013; Duraisamy R 2019**) . The research in the dental profession regarding the knowledge of Basic Life Support have been found to be deficient (**Saquib SA et al 2019**). Many authors found that the dental specialists had low knowledge of BLS and many of them did not receive any theoretical and practical exposure for cardiopulmonary resuscitation (**Saquib SA et al 2019**).

Harms and benefits-

Most of the dental students, dental specialists and staff have poor knowledge of BLS which can prove to be harmful as any patient can have a cardiac arrest while undergoing a dental procedure. There isn't enough awareness regarding basic life support in many medical and dental students, post graduates and staff due to various reasons. The first being inadequate exposure or access to courses or workshops regarding BLS. Also, a lot of students and staff consider it unimportant as it isn't directly related to their field of expertise. Attending various courses, lectures and workshops on BLS would increase the knowledge and awareness and would make the dental students, dental specialists and staff well equipped to handle patients or people needing a CPR in case of an emergency.

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Limitations- This study was conducted in one centre on only post-graduate students. A multi-centric study with varied sample size can give a better perspective of awareness and knowledge in dental student population.

10.Future implications-

Basic Life Support is a form of medical care which is usually given in an emergency or a life-threatening situation to people who are drowning, choking or are having a cardiac arrest. Regular workshops and courses should be conducted in colleges, universities and hospitals to increase the awareness and knowledge as it can save a life of a person in times of need.

11.Conclusion:

This questionnaire based study amongst post graduates of dental college was conducted to assess the knowledge of these post graduate students about Basic Life Support. The findings revealed 3rd year MDS students had better knowledge than 2nd year MDS students. The residents of oral and maxillofacial surgery had high knowledge whereas the residents of pedodontics had low knowledge. It can be concluded that once a student becomes aware of possibility of medical complication in a dental setting, he becomes more interested to acquire the knowledge and expertise of BLS to manage the same.

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