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1. Title page

A SURVEY TO DETERMINE SELF-REPORTED CONFIDENCE AMONGST EMERGENCY CENTRE NURSES IN INITIATING BLS ACROSS EMERGENCY CENTRES IN CAPE TOWN

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2. Abstract

Background: In any Emergency Centre (EC), the response to a cardiac arrest is regarded as the most time critical intervention. The first responders are usually EC nurses who need to initiate basic life support (BLS) without the presence of a doctor. EC nurses should (by the nature of their environment) be the most confident and competent providing this essential skill compared to other nursing personnel. This study aimed to determine how confident Cape Town EC nurses are, to initiate BLS and which factors influenced their performance.

Methodology: A CROSS-SECTIONAL survey was conducted using an anonymous questionnaire amongst 300 nurses, working in emergency centres, in both public (low resourced) and private (high resourced) hospitals, in Cape Town.

Results: 279 out of 300 questionnaires were completed. Questions, using a Lickertscale, were asked regarding self-assessed confidence in recognising a cardiac arrest, managing an airway and initiating cardio respiratory resuscitation (CPR). A score of 8 and above, out of 10, was assessed as "very confident". A total of 61 % respondents scored 8 and above regarding recognising a cardiac arrest. For managing an airway, 59% scored 8 and above whilst 67% scored 8 and above regarding the initiation of CPR. A comparison of self-confidence between private versus public hospital nurses was also evaluated.

Conclusion: Emergency Centre nurses are not confident to initiate BLS, especially in public hospitals within the Cape Town metropole. Further research is needed to objectively evaluate EC nursing's BLS skills and whether regular BLS training will improve their future confidence.

3. Introduction and background

Cardiac arrest is the most urgent emergency in any hospital setting. Early detection and implementation of resuscitation has been found to optimise a patient's survival rates[1]. The first responder to a hospital cardiac arrest scene is usually a nurse. Nurses should be both competent and confident to initiate BLS, especially in an emergency centre (EC) where there is an increased likelihood of cardiac arrests occurring.

Several studies focusing on nurses' BLS knowledge and training, were conducted during the last 2 decades, who concluded that both their knowledge and training were inadequate[2-7]. A 2000 Helsinki, Finland study found that essential BLS skills in both nurses and nursing students were inadequate in terms of the prompt assessment for the need of immediate resuscitation initiation in cardiac arrest patients. The best predictor for adequate airway opening manoeuvres was provider self-confidence and the best predictor for adequate ventilation was recent resuscitation training exposure within the previous 6 months[2]. A follow-up 2009 study, also done in Helsinki, assessed nursing attitudes towards resuscitation and concluded that intensive education increased self confidence during the use of CPR with defibrillation. However, this did not reduce the anxiety of administering CPR with defibrillation[3].

Little data is available in South Africa regarding nursing competence, knowledge and confidence regarding BLS. The most recent study was performed in 2009 at Universitas Hospital in Bloemfontein, which concluded that nurses were inadequate in their knowledge and practical skills in all areas of BLS. It also found a reduction in recent (less than 1 year) attendances of BLS training courses by hospital nurses[4].

The motivation for this study was to assess self-confidence of EC nurses in initiating BLS. The research project focused entirely on this group as these are nurses who should

be the most confident to properly initiate life-saving measures such as BLS. Previously mentioned studies had a broader focus on general hospital nursing personnel.

4. Aim and objectives

The aim of this study was to determine whether emergency centre nurses are confident to initiate BLS. This was defined as recognising a cardiac arrest, opening the airway, giving rescue breaths and initiating CPR, in emergency centres, in Cape Town, South Africa. The objectives were whether there was a difference in confidence levels between public and private sector nurses and the specific areas of BLS in which nurses did not feel confident.

5. Methodology

A CROSS-SECTIONAL survey was conducted, using an anonymous questionnaire, containing 11 questions. This was distributed to nurses working in both the public and private hospitals EC's, to complete. Inclusion criteria were registered nursing staff working in an emergency centre on a full time or part-time basis (greater than 20 hours per week). Non-emergency centre nurses were excluded from this study.

Cluster sampling took place both in private and public hospitals. The public domain included community health centres (CHC), district and regional hospitals in Cape Town who have 24-hour access to EC's as recognised by the Western Cape Department of Health. No tertiary institutes were sampled, as there are no EC's within these hospitals. Equal proportions of CHC's, district, regional and private hospitals nurses were sampled to include all level EC nurses.

South Africa has a large, well-developed, resource intensive and highly specialised formal private health sector[8]. The sector is mainly funded via contributions to medical schemes by members and provides health insurance to 7 million out of total population of approximately 47 million[8]. The private sector that was sampled included the Netcare Group, Life Group and Medi-Clinic Ltd. Collectively, these groups own and operates more than 75% of all private sector beds and more than 80% of all private sector theatre facilities in South Africa[8].

The sample was divided by the number of Cape Town participating hospitals, within each sub group of hospitals, to determine how large the cluster sample in each hospital should be. Thus, an equal number of participants were randomly selected from every individual hospital within the CHC, district, regional and private hospitals.

The questionnaires were completed at the changeover of nursing shifts to include both day and night staff. The main purpose of this study was descriptive in nature, and a sample size of 200 provided proportional estimates to an acceptable degree of accuracy as proposed by a Stellenbosch University statistician. More than 200 responses would only marginally improve the accuracy of estimates. For comparing different groups, the proposed sample size was acceptable to detect a 20% difference between the groups at 80% power. However, the distributions of 300 questionnaires were decided upon in the event of non-responders and/or spoiled questionnaires.

Questionnaires were distributed to nursing personnel by the primary researcher. Participating nursing staff was asked to complete these questionnaires in the presence of the primary researcher. This diminished the possibility of duplicate questionnaires being completed and allowed the primary researcher to collect data immediately and

guarantee that there was no missing data. Each questionnaire was assigned a code thus preventing mishandling of data and keeping each set anonymous.

1	Experience (in years) of nurses in the emergency centres
2	Nursing grade (e.g. professional nurse)
3	Completion of a trauma, critical care or ACLS course (& when)
4	Private or public sector nurse (more than 50% of total working time)
5	Whether a BLS course was available, completed and the completion time
6	Confidence level in initiating BLS using a Lickert scale rated from 0-10 and whether a doctor's presence boosted their confidence
7	Areas of BLS where nurses do not feel confident
8	Frequency of cardiac arrests in public versus private hospitals
TABLE 1	**Data collected by the questionnaire**

The primary researcher inserted the data into an electronic spreadsheet (Microsoft Excel®, Microsoft Corporation, Redmond, WA) to verify data and look for discrepencies. The electronic spreadsheet was password protected to ensure the integrity of the data.

7. Statistical analysis

Summary statistics were calculated using frequency tables, histograms, means and standard deviations with the assistance of a statistician. For comparison between private and public hospitals, cross tabulations with the Chi-square test were conducted.
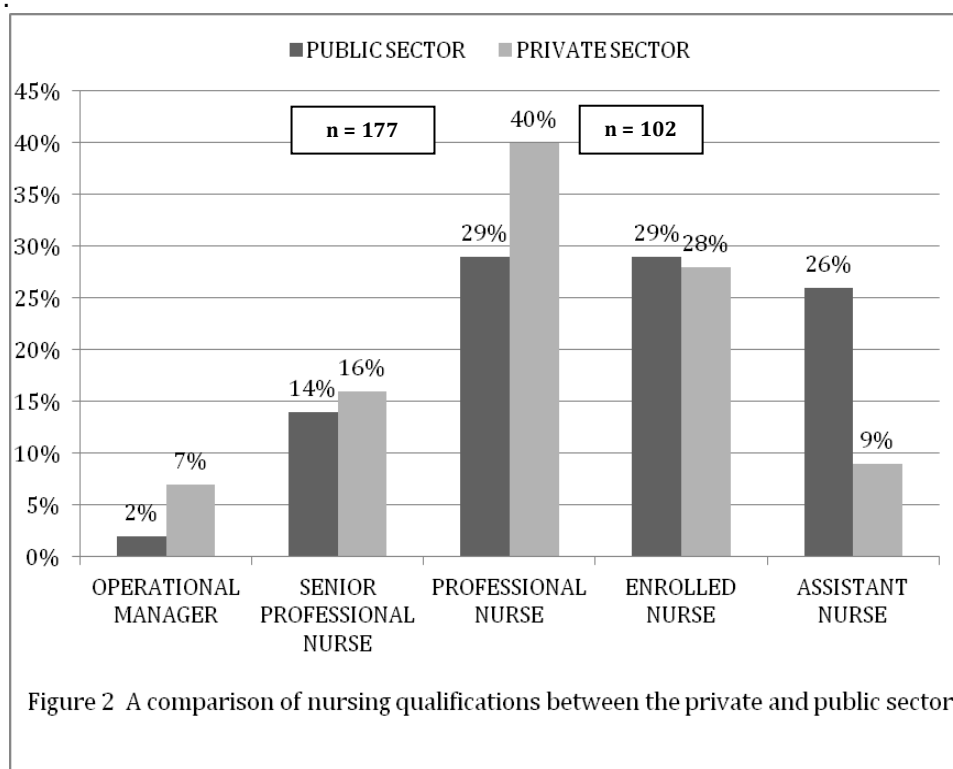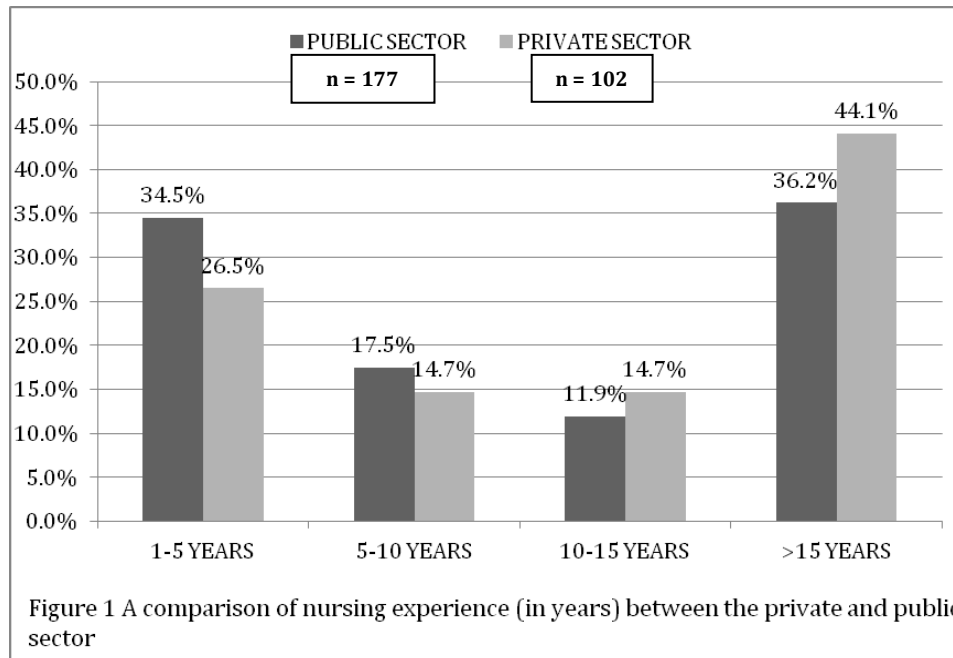
8. Results

Out of the potential 300 participants, 279 questionnaires were completed. This was due to some nurses not being available to complete the questionnaire on their shift. The private sector hospitals have more experienced and higher qualified nursing staff allocation in their EC's compared to their public hospital peers (Figure 1 and 2).

Two thirds of the sample group were from the public sector and one third from the private sector. Of the public sector, 44% were from Community Health Centres and the 56% were from the district and regional Hospitals

Figures 3, 4 and 5 shows a comparison between public and private hospitals regarding self-assessed confidence in recognising a cardiac arrest, confidence in managing an airway and initiating CPR . Participants answered by ticking the appropriate number on a Likert scale numbered between 0 to 10 where a score of 8 and above signified "very confident". In recognising a cardiac arrest, 46/279 (16%) scored 8, 31/279 (11%) scored 9 and 95/279 (34%) scored 10. The mean score for the public sector was 7.1, the standard deviation was 2.4 (figure 3). In private hospitals, the mean was 8.7 and the standard deviation was 1.8 (figure 3). For managing an airway, 35/279 (13%) scored 8, 26/279 (9%) scored 9 and 104/279 (37%) scored 10. The mean score for the public

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sector was 6.9 and the standard deviation was 2.7 (figure 4). In comparison the private EC's had a mean score of 8.6 with a standard deviation of 2.1 (figure 4). For commencing CPR, 32/279 (11%) scored 8, 28/279 (10%) scored 9 and 128/279 (46%) scored 10. The mean score for the public sector was 7.5 and the standard deviation was 2.3 (figure 5). In the private sector, the mean was 9.1 and the standard deviation was 1.5 (figure 5).
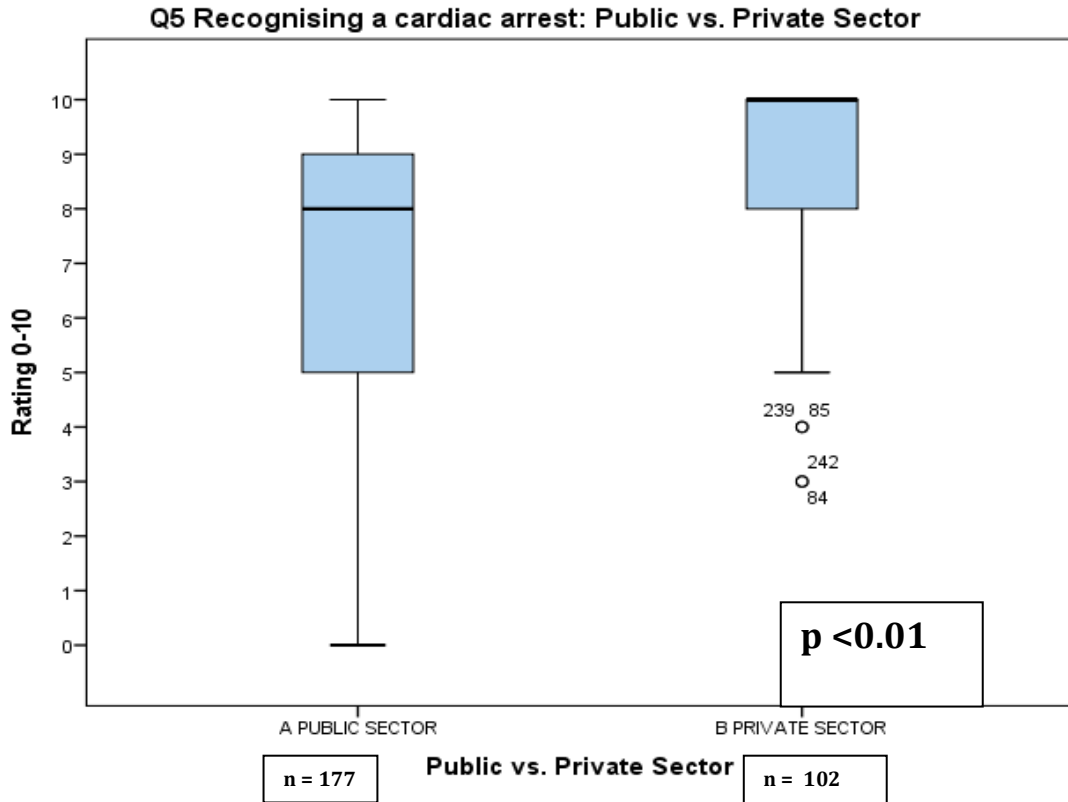

Figure 1 A comparison of nursing experience (in years) between the private and public sector

Figure 2 A comparison of nursing qualifications between the private and public sector

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Figure 3: A comparison between public and private nurses in recognising a cardiac arrest(outliers identified by circles).
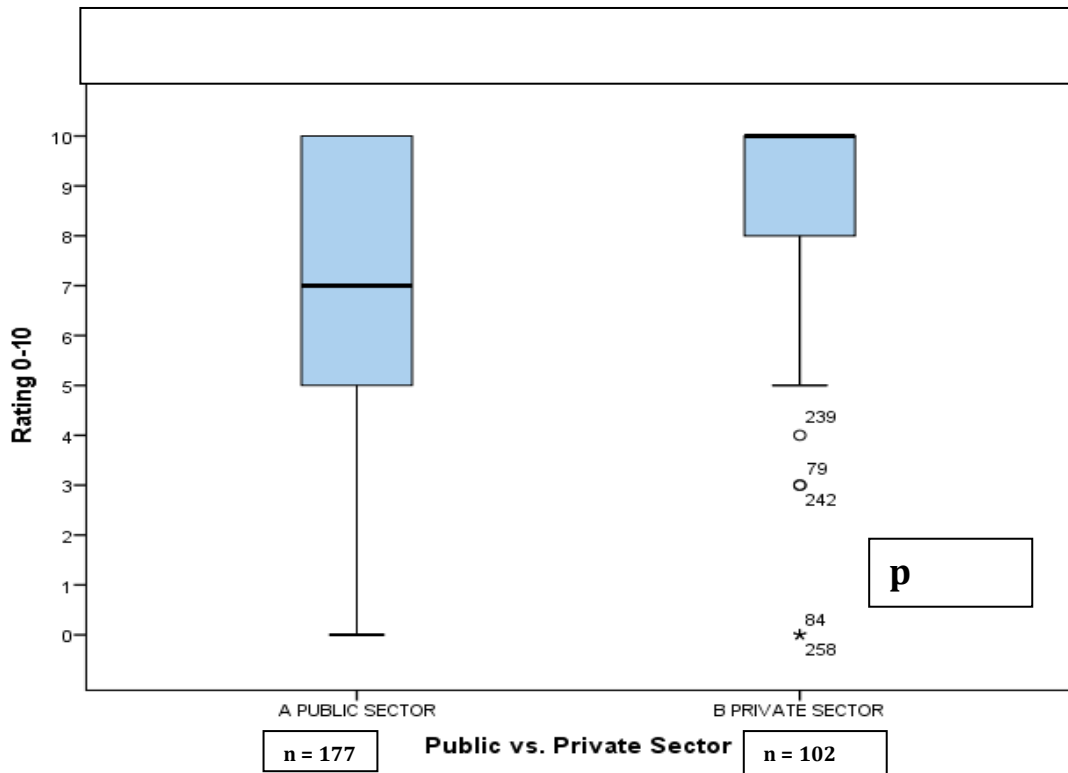

Figure 4: A comparison between public and private nurses regarding managing the airway (the two types of outliers are identified by symbols: circles for outliers, and stars for extreme outliers).
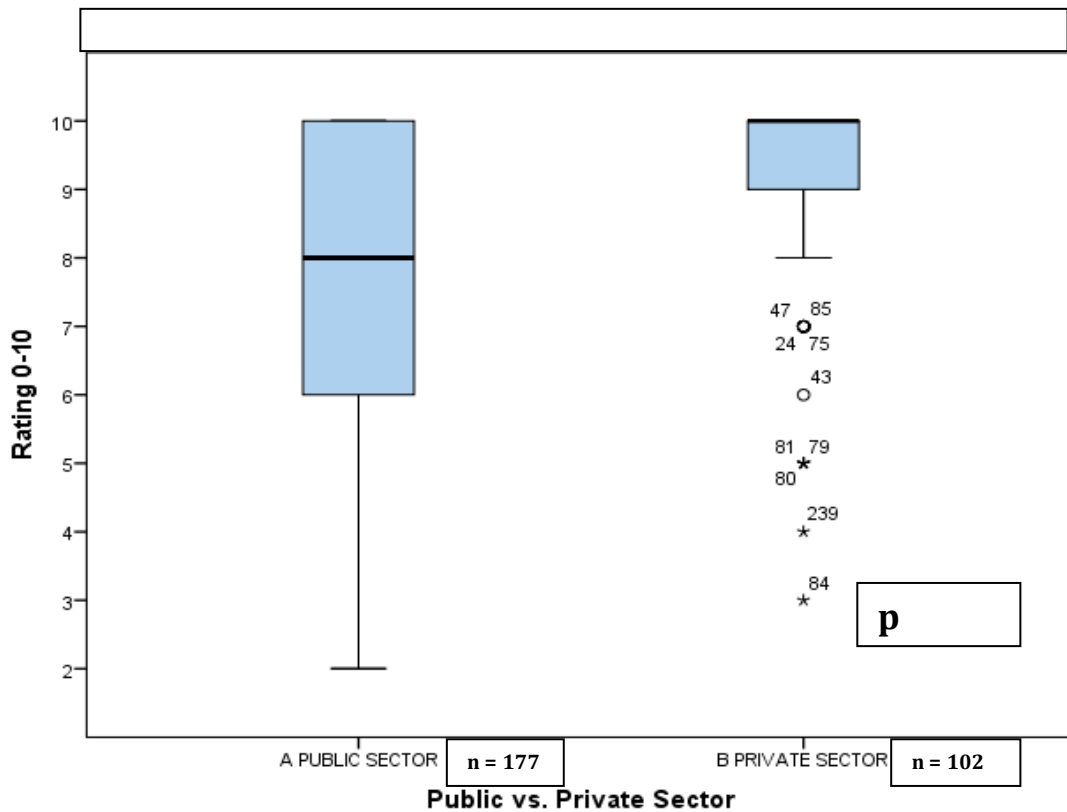
Figure 5: A comparison between public and private nurses regarding commencing CPR (the two types of outliers are identified by symbols: circles for outliers, and stars for extreme outliers).

In recognising cardiac arrest and managing the airway were areas where EC nurses felt least confident across the board. In comparison, they felt significantly more confident in commencing CPR (p-value <0.01). Participants were asked whether a doctor's presence boosted their confidence. Of the participants, 233/279 (84%) answered yes versus 46/279 (16%) that answered no. A comparison between public and private showed 159/177 (90%) public nurses answered yes vs. 74/102 (72.5%) in private hospitals (p value<0.01).

Two hundred and thirteen (76%) nurses confirmed that formal CPR/BLS training courses were accessible to them via their own emergency centres. A comparison between private and public EC's revealed that in private 101/102 (99%) answered yes vs. 112/177 (63%) in public hospitals. Of those nurses that answered yes in the public sector, 62% worked in Community Health Centres, 61 % in district hospitals and 87% in regional hospitals.

Attendance of a recent BLS course was the subject of the next question on the questionnaire. A hundred and seventeen (42%) had completed a BLS course within less than a year from answering the questionnaire with 46/177 (26%) being in the public and 71/102 (70%) in private hospital's EC's. 99/279 (35%) completed a course more than a year ago with 69/177(39%) from public and 30/102(29%) from private hospitals and the remainder (23 %) had never done a BLS course with 1/102 being from private and 62/177 (35%) from the public sector. The difference between public and private had a p value of 0.

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Nurses were also asked about a completion of a trauma, critical care or any other course related to resuscitation. The results from this question were 51/279 (18%) had completed a trauma course, 13/279 (5%) had completed a critical course, 84/279 (30%) had done an "other" courses and 131/279 (47%) had never done any of these recommended courses. Of the private EC nurses 33/102 (32%) had done a trauma course, 8/102 (7.8%) a critical care course, 39/102 (38%) an "other" course and 22/102 (21%) had not completed any course. In contrast, 18/177 (10%) in public sector completed a trauma course, 5/177 (2.8%) a critical care course, 45/177 (25%) an "other" course and 109/177 (61.5%) had never completed any of the recommended courses.
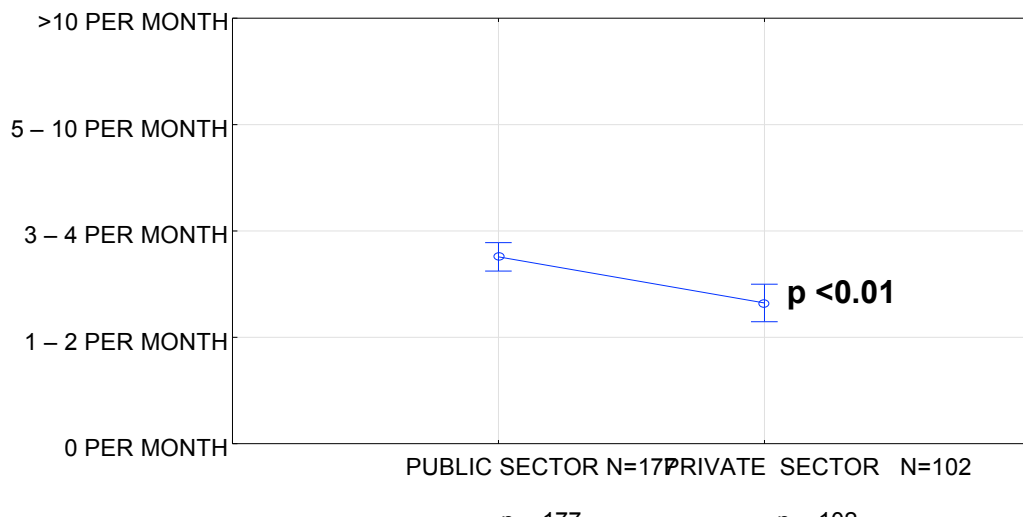

FIGURE 6: Comparison of Private and Public Nurses Average Exposure to Cardiac Arrest The public nurses were exposed to a mean of 2.8 cardiac arrests versus private nurses who had a mean of 2.3 exposures

The majority of nurses 132/279 (47%) reported that they were exposed to 1-2 cardiac arrests per month, 79/279 (28%) were exposed to 3-4 per month, 40/279 (14%) were exposed to 5-10 per month, 19/279 (7%) were exposed to 0 per month and 9/279 (3%) reported an exposure to >10 cardiac arrests per month. Figure 6 shows the difference in the average reported exposure to cardiac arrests between public and private nurses.

8. Discussion

This study gives possible insight into the lack of self- reported confidence levels of nurses working in EC's. However, limitations of this study are that nurses were not objectively assessed on their theoretical and practical BLS abilities. Further studies in these areas are required. Other limitations were that participants may not have completed the questionnaire in the most truthful manner if they felt that their jobs were at risk. Measures were taken to assure participants that they would remain anonymous and their consent was required before completing the questionnaire. Some nurses may have also had an over-confident sense of their abilities based on their experience rather than on actually attending BLS courses regularly. Bias may have existed between sampling predominantly night-duty nurses and day-duty nurses. This was minimised by distributing questionnaires at change of shift where both groups will be present. There may also have been bias between these two groups in answering if either group had just completed a long shift and felt compelled to answer the questionnaire whilst not putting much thought into the answers. There was an attempt to minimise this by emphasising that the survey was entirely voluntary. Strengths included liaising with nursing heads of the hospitals that were sampled who encouraged participation by their nursing staff in completing the questionnaire. Input from EC nursing personnel had been sought to create an easily comprehensible questionnaire and minimise the number of questions that were not correctly understood and answered.

Alarming trends were noted for all aspects of BLS; only 61% scored their confidence levels 8 and above in recognising a cardiac arrest, 59% scored themselves 8 and above for managing an airway and 67% for commencing CPR. This is worrying especially because all nurses working in the EC should be confident to perform BLS. Nurses in both public and private reported a lack of confidence in recognising cardiac arrests and managing airways but seemed significantly happier with commencing CPR. These areas need to be addressed when updating BLS course content and teaching methods. A doctor's presence should also not have any bearing on a nurse's confidence to initiate BLS. Eighty three percent of nurses unfortunately needed a doctor's presence to initiate BLS with the majority coming from the public sector.

Access to a BLS course was excellent for private nurses at 99% whereas the public sector decidedly fell short at only 63%. Even though 62% had access to BLS at CHC's, more than one third of these participants did not have access to training courses. This is particularly of concern as most patients first point of contact with the health services are at the CHC 's. Sixty three percent is also considerably less access as compared to nursing personnel in the study done by Keenan M et al [4] at Universitas hospital in Bloemfontein where 77.5% of nursing staff had access to BLS. However, this figure pertained to nursing staff in wards, Highcare / ICU and outpatient departments. This is also a cause for concern as all nurses working in the EC should have regular access to BLS courses. Also, access to advanced courses like critical care courses and trauma courses was more evident in the private rather than public sector. This is ironic, as on average, the private sector nurses reported that they were exposed to less cardiac arrests per month than the public sector. This discrepancy may be due to budget constraints and staff shortages in the public sector. A future recommendation could be a possible collaboration between the private and public sector. This would involve improving access of public EC nurses to regular BLS courses as well as more advanced trauma and critical care courses if budget constraints in the public sector are the limiting factor in improving BLS skills. A second recommendation would be to increase exposure of all nurses (but especially those who feel a lack confidence) to cardiac arrests to improve their self-confidence. This could possibly be accomplished by assigning them periodically to participate in all cardiac arrests presenting to the unit and allowing them to participate in all aspects of BLS.

9. Conclusion

This survey indicates that a large proportion of nurses in the EC in the Cape Town Metropole do not feel confident to initiate BLS and need the presence of a doctor to boost their confidence enough to proceed with this potentially life-saving intervention. This is most evident amongst nurses in the public sector. There is also a lack of access to regular BLS training which was once again more confined to the public sector. More research is needed to objectively ascertain EC nurses BLS skills and whether regular BLS teaching improves confidence.

10. Acknowledgements

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11. Disclosures

There are no disclosures by any of the concerning parties.

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