KNOWLEDGE AND ATTITUDE TOWARDS CARDIOPULMONARY RESUSCITATION BY NON-MEDICAL STAFF AT A MEDICAL SCHOOL IN GAUTENG

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A research report submitted to the University of the Witwatersrand in partial fulfilment of the degree for master's in medicine (Emergency Medicine)

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Say (O Muhammad SAW): "Verily, my Salat (prayer), my sacrifice, my living, and my dying are for Allah, the Lord of the 'Alamin (mankind, jinns and all that exists). Al-ʾAnʿām (162)

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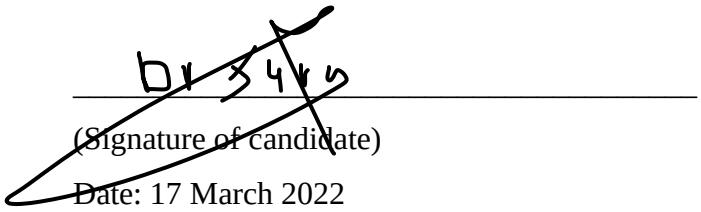
DECLARATION

I, Dr Saeb Jarghon, hereby declare that this Research Report is my own, unaided work. It is being submitted for the Degree of Master of Medicine (Emergency Medicine) at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at any other University.



(Signature of candidate)

Date: 17 March 2022

DEDICATION

To the Almighty Allah who gave me life, grace and favour. He has given me strength in every step-in life and for this programme.

To my parents Akram and Tahani for their unflinching support and encouragement in every area of life. And to my family for their unconditional love, support, and patience.

ARTICLE FOR SUBMISSION

TITLE

Knowledge, attitudes and perceptions regarding CPR among non-medical staff at a medical school in South Africa

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ABSTRACT

Background: Sudden cardiac arrest can occur unexpectedly to any person and at any place including at medical schools. Improved outcomes after cardiac arrest are dependent on the initiation of early first responder high quality cardiopulmonary resuscitation (CPR) and rapid defibrillation. There is a lack of data pertaining to the knowledge, attitudes, and perceptions of non-medical staff at medical schools regarding CPR.

Objective: To determine the knowledge, attitudes and perceptions of non-medical staff at a medical school in South Africa regarding CPR.

Methods: A paper-based questionnaire was administered to non-medical staff fulfilling inclusion criteria at the medical school. Data was collected between 01 August and 25 October 2020.

Results: The final study sample comprised of 150 participants. Of these, 68.7% were female, 72.7% were ≤ 40 years old, 41.3% had a postgraduate university degree, 48.0% had witnessed a medical emergency at the medical school premises and 30.7% had previously undertaken first aid or CPR training. The mean knowledge score was 4.4 ± 1.6 out of 12 with only 16.7% knowing what was the first thing to look out for during a medical emergency and 18.7% knowing the location of the automated external defibrillator. Most participants (90.7%) indicated that CPR training should be mandatory for all employees.

Conclusion: Non-medical staff surveyed displayed suboptimal knowledge but positive attitudes and perceptions towards CPR. Although this was a single centre study, these results can be used to motivate for CPR training of non-medical staff at all medical schools.

KEYWORDS

Cardiopulmonary resuscitation, CPR, Non-medical staff, medical school, CPR knowledge, CPR attitude, CPR perceptions.

INTRODUCTION

Life-threatening emergencies including sudden cardiac arrest (SCA) can occur any at place, either in-or out-of-hospital and accounts for the majority of deaths globally with survival rates varying significantly from region to region.[1] Annually, out-of-hospital cardiac arrest (OHCA) is responsible for approximately 350 000 deaths in Europe and another 300 000 deaths in the United States.[2,3] The global survival rate of OHCA remains dismal at 8.8%.[4] Mortality for the most part is determined by the time lag between the onset of cardiac arrest and initiation of high quality cardiopulmonary resuscitation (CPR) and the arrival of emergency medical services (EMS).[5]

Sudden cardiac arrest has various aetiologies, with coronary artery disease representing up to 80% of cases. Studies among various segments of the South African population have revealed a high burden of risk factors for cardiovascular disease, which is likely to be associated with an increased risk of SCA.[6,7] The annual prevalence of OHCA in South Africa is estimated at 23.2 per 100 000 persons.[8]

The American Heart Association's (AHA) chain of survival for OHCA comprises of six links; namely 1) recognition of cardiac arrest and activation of the emergency response system, 2) early CPR, 3) rapid defibrillation, 4) advanced resuscitation by EMS, 5) post-cardiac arrest care and 6) recovery.[9] The first three links can be initiated by any first responder on scene who may be a trained medical person or a bystander. Minimum bystander CPR requirements include the ability to recognize a person in cardiac arrest, calling for help and initiating timeous hands-only chest compressions.[10] Barriers to laypersons performing CPR include a lack of training and fears around causing more harm than good.[11]

Medical schools are staffed by medical and support non-medical personnel such as lecturers, administration staff, security staff, cleaners, librarians etc., who can be regarded as laypersons. Knowing that cardiovascular disease is a common cause of death in South Africa and its strong association with SCA, it is imperative that laypersons are capable of performing the first three links of the AHA chain of survival. Previous studies have reported on the knowledge, attitudes and perceptions of medical students and healthcare professionals regarding CPR, however, there

is a lack of studies pertaining to this among non-medical staff at medical schools.[12,13] Hence, we aimed to determine the knowledge, attitudes and perceptions regarding CPR of non-medical staff at a medical school in South Africa.

MATERIALS AND METHODS

This was a cross-sectional questionnaire-based study. The study population comprised of non-medical staff who were employed at the medical school (faculty of health sciences) premises of an established university situated in South Africa. As per the faculties human resources department, the faculty has seven schools (divisions) situated at the premises with a total of 269 non-medical staff that were employed at the time that the study was conducted. Permission to conduct the study was granted by the Dean of the Faculty of Health Sciences. Ethics approval was obtained from the Human Research Ethics Committee of the University of Witwatersrand (certificate clearance no. M200632).

Study participation was voluntary. We aimed to enrol a convenience sample of at least 150 staff members. All staff members with a medical or nursing degree were excluded. The questionnaire was developed by the study investigators and included a total of 28 questions pertaining to sociodemographic characteristics, medical emergencies that were encountered at the medical school premises, knowledge regarding basic CPR, attitudes and perceptions towards performing CPR and reasons for not previously undertaking CPR training.

Data was collected between 01 August and 25 October 2020. Potential study participants were first handed a study information leaflet that summarized the study aims and objectives. After confirming eligibility for study participation and obtaining informed consent, the paper-based study questionnaire was handed over to the participant for completion. To preserve participant confidentiality, no identifying information was collected.

Collected data was thereafter captured into an electronic data spreadsheet (Microsoft 365, Version 16.0.13029.20232) and analysed. Since most of the data was descriptive in nature, these were presented using frequency and percentage tables and graphs. To determine the CPR knowledge score, one point was given for each of the 12 questions that were answered correctly.

We thereafter calculated the mean and standard deviation of the score for the entire cohort of participants.

RESULTS

Of the 158 questionnaires that were distributed, a total of 150 (94.9%) were completed. Table 1 describes the characteristics of study participants. In total, 103 (68.7%) were female, 109 (72.7%) were ≤ 40 years old, 62 (41.3%) had a postgraduate university degree, 86 (57.6%) were lecturers, and 88 (58.7%) were employed at the university for <5 years. A total of 72 (48.0%) participants reported that they had witnessed a medical emergency at the medical school premises. Among the medical emergencies witnessed, difficulty breathing, collapse and seizures accounted for the most common conditions that were witnessed by 47 (31.3%), 44 (29.3%) and 30 (20.0%) participants respectively. Overall, 46 (30.7%) participants had previously undertaken first aid or CPR training.

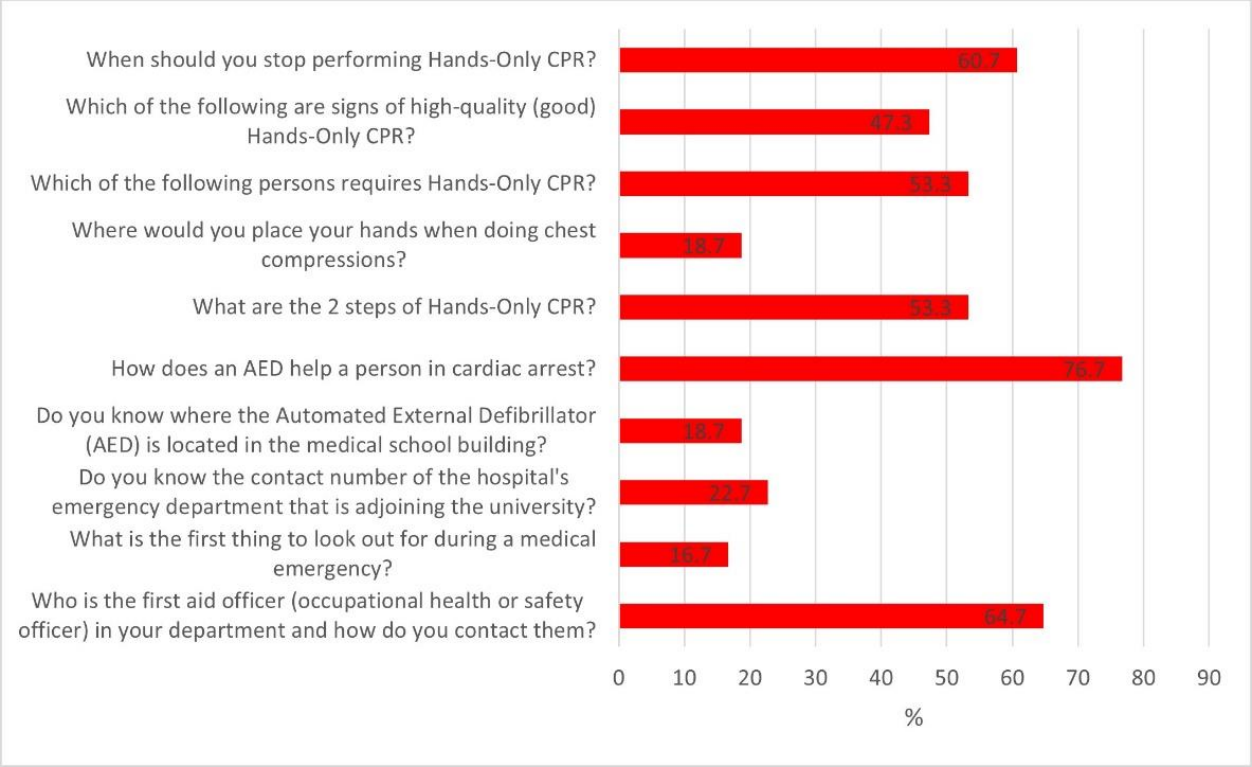
Table 1: Characteristics of study respondents

	n (%)
Sex	
Female	103 (68.7)
Male	47 (31.3)
Age category	
≤ 40 years	109 (72.7)
> 40 years	41 (27.2)
Highest level of education	
Didn't complete matric	2 (1.3)
Matric certificate	16 (10.7)
Diploma	23 (15.3)
Undergraduate degree	47 (31.3)
Postgraduate degree	62 (41.3)
Position of employment	
Lecturer	86 (57.3)

Administration	43 (28.7)
Other (security, cleaners, library)	21 (14.0)
Duration of current employment	
< 6 months	7 (4.7)
6-12 months	20 (13.3)
1-5 years	61 (40.7)
5-10 years	20 (13.3)
>10 years	42 (28.0)
Medical emergencies witnessed on medical school premises	
Difficulty breathing (e.g., asthma attack)	47 (31.3)
Collapse	44 (29.3)
Seizures (fits, convulsions)	30 (20.0)
Choking	20 (13.3)
Heart attack	10 (6.7)
Stroke	7 (4.7)
Previously undertook first aid or CPR training	46 (30.7)

CPR – cardiopulmonary resuscitation

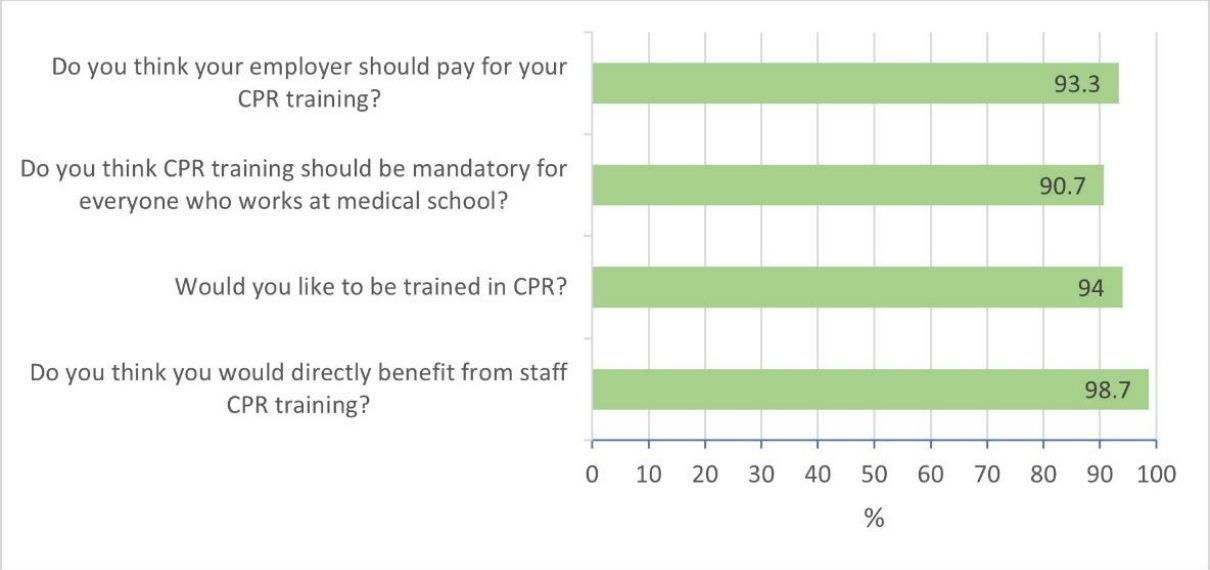
Figure 1 describes the percentage of correct answers for each of the CPR knowledge questions. Of note, only 25 (16.7%) participants knew what was the first thing to look out for during a medical emergency, only 28 (18.7%) knew where the automated external defibrillator (AED) was located in the medical school building, only 28 (18.7%) knew where to place their hands when doing chest compressions and only 34 (22.7%) knew the contact number of the hospital emergency department adjoining the medical school. Of the 10 CPR knowledge question, the mean number of correct answers was 4.4 ± 1.6.



CPR – cardiopulmonary resuscitation

Figure 1: Percentage of correct answers for each of the CPR knowledge questions

Figure 2 depicts the attitudes and perceptions of participants towards the practice of CPR. Almost all participants thought that they would directly benefit from staff CPR training (n=148, 98.7%), would like to be trained in CPR (n=141, 94.0%), thought that CPR training should be mandatory for everyone working at medical school (n=136, 90.7%) and thought that their employer should pay for their CPR training course (n=140, 93.3%).



CPR – cardiopulmonary resuscitation

Figure 2: Attitudes and perceptions of study participants towards the practice of CPR

Barriers to CPR training are described in figure 3. Among the 104 (69.3%) participants who were not CPR trained, the two most common reasons were that they never thought about it (n=56, 53,8%) and that they were not a healthcare worker (n=27, 26.0%).

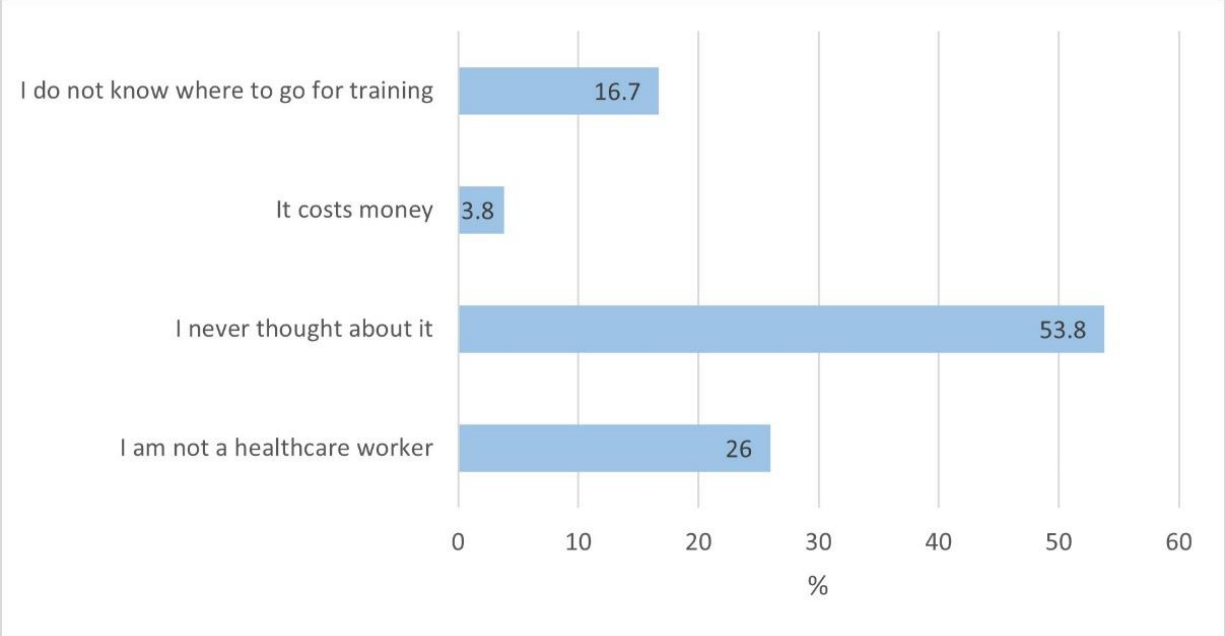


Figure 3: Barriers to CPR training among the one-hundred and four CPR untrained participants

DISCUSSION

To our knowledge, this is the first study to have evaluated the knowledge, attitudes and perceptions of non-medical staff at a medical school in South Africa regarding CPR. In this study, 48% of participants reported that they had witnessed a medical emergency at the medical school premises, with breathing difficulty, collapse, convulsions, choking, heart attack and stroke being reported among the conditions that were witnessed. Comparatively, in a similar design study by Ojifinni et al., among student teachers in South Africa, participants reported that trauma-related conditions, allergic reactions, breathing difficulties, convulsions, loss of consciousness, choking and drowning were among the medical conditions that were witnessed during school-based practice teaching sessions.[14] According to the Global Initiative for Asthma (GINA), South Africa has the fourth-highest asthma-related mortality in the world,[15] while there are more than 200 reported cardiovascular and stroke related deaths in South Africa every day.[16] Hence, it is recommended that CPR training courses also include basic educational material pertaining to commonly witnessed medical emergencies and the steps to be taken while awaiting expert medical assistance.

In this study, approximately a third (30.9%) of participants reported participating in a first aid or CPR training course. The overall mean CPR knowledge score was 4.4 ± 1.6 out of the 12 survey questions in this category, with participants scoring poorly in questions pertaining to recognising a medical emergency, location of the AED and chest compression method. Comparatively, a study conducted by Hung et al., among college students in Hong Kong reported that 55.3% of participants had previous CPR training and the mean CPR knowledge score was 4.97 (SD 1.61) out of 10, with participants scoring poorly in questions pertaining to CPR sequence, bystander action and chest compression method.[17] In the study by Ojifinni et al., the mean knowledge score was 4.0 ± 1.7 out of 12 with questions pertaining to recognising a medical emergency, the correct steps of using an AED and the method of CPR scoring low.[14] Another study conducted by Alotaibi et al., among dental students and staff at a university in Saudi Arabia reported that 99.1% of participants had previously undertaken CPR training, and the mean knowledge score was 5.99 out of 12 with participants scoring poorly in questions pertaining to CPR in new-borns and the management of a choking adult.[18] Hence, our findings are in keeping with general

international trends, which indicates that CPR knowledge among individuals at tertiary education institutes is generally poor. This calls for all tertiary institutes to implement measures and policies that will improve CPR knowledge and skill. These measures should include training of a higher number of staff/ students and ensuring regular re-training.

In this study, almost all participants indicated that they would benefit from and would like to be trained in CPR, that CPR training should be mandatory for all medical school employees and that the employer should be responsible for covering the cost of CPR training. Although it is desirable that CPR training is offered to all individuals at the workplace, the Occupational Health and Safety Act of South Africa stipulates that where there are more than 10 employees, there should be a trained person at the workplace premises who is able to assist with a medical emergency, with shops and offices requiring at least one trained person per 100 employees, and other entities requiring at least one trained person per 50 employees. While it would be regarded due courtesy for the employer to cover the full cost or at least partially subsidise the cost of employee CPR training, the employer is by no means bound to cover such costs and may stipulate that CPR or first aid certification to be a condition of employment.[19,20] We however recommend that employers should explore other options such as video-based CPR self-instruction, which is time-saving, less expensive, can be repeated more frequently and may be more effective than traditional classroom based CPR training courses.[21,22]

In this study, barriers to undertaking CPR training among the 69.3% of CPR untrained participants were reported as not having thought about it (53.8%), not being a healthcare worker (26.0%), not knowing where to train (16.7%) and cost (3.8%). Comparatively, a study among 883 allied health university students in Jordan, reported that 81.8% of participants were untrained, with not knowing where to train (33.0%), lack of time (32.1%), cost (14.1%), lack of interest (12.3%) and lack of availability (8.4%) being reported as barriers to CPR training.[23] A qualitative study that enrolled 25 school leadership members and teachers from eight schools in Denmark identified three key themes as barriers to CPR training. These were described as insecurity about one's own CPR instruction skills, insecurity about one's own CPR skills, and organisation of CPR training.[24] Another study that was conducted among six neighbourhoods with relatively high rates of OHCA in Ohio, USA, reported that financial cost, lack of

information, and fear of self-harm were the major barriers to CPR training.[25] Yet another mixed qualitative and quantitative survey study comprising 137 laypersons in the USA, reported that fear of performing CPR incorrectly, concern of causing injury to the patient and fear of being sued were the most common barriers to CPR training.[26] In the study by Ojifinni et al., not knowing where to train (76.4%), not being a healthcare worker (59.0%), not thinking about it (36.9%) and cost (29.9%) were reported as major barriers to CPR training.[14] Hence, there is a need to initiate public awareness programmes that will focus on allaying fears and concerns regarding CPR training.

LIMITATIONS

There are some limiations to this study. Firstly, the study was conducted at a single teriary instiute, hence, our results cannot be genealised to other institutes in South Africa. Secondly, since the study was conducted during the peak of the COVID-19 pandemic with there being modified staff working schedules in place, the number of security staff, cleaning staff, library staff etc., who were available to partipcate in the study was low, which may also have influnced our study findings. Nevertheless, we are hopeful that the findings of our study will encourage similar studies at other tertiary educational institutes and aslo serve to enhance the knowledge, attitudes and perceptions regarding CPR in general.

CONCLUSION

Our study findings are in keeping with general international trends. A large proportion of the study participant's had witnessed a medical emergency at the study site. Participants however displayed suboptimal knowledge but positive attitudes and perceptions towards CPR. Although this was a single centre study, these results can be used to motivate for CPR training of non-medical staff at all tertiary educational institutes. Future studies should also aim to determine the knowledge, attitudes, and perceptions regarding CPR at other institutes locally.

IMPLICATIONS OF THE STUDY

Dissemination of these study results to the appropriate persons is imperative in order to ensure some type of CPR training for non-medical staff.

RECOMMENDATION(s)

Future studies should aim to determine the knowledge, attitudes, and perceptions regarding CPR at other similar institutions locally. Tertiary education institutions are encouraged to implement measures and policies that will improve CPR knowledge and skill of their staff. These measures should include training of a higher number of staff and ensuring regular re-training

REFERENCES

1. Wong CX, Brown A, Lau DH, Chugh SS, Albert CM, Kalman JM, et al. Epidemiology of Sudden Cardiac Death: Global and Regional Perspectives. Heart Lung Circ [Internet] 2019;28(1):6–14. Available from: http://www.ncbi.nlm.nih.gov/pubmed/30482683
2. Berdowski J, Berg RA, Tijssen JGP, Koster RW. Global incidences of out-of-hospital cardiac arrest and survival rates: Systematic review of 67 prospective studies. Resuscitation [Internet] 2010;81(11):1479–87. Available from: https://linkinghub.elsevier.com/retrieve/pii/S0300957210004326
3. Roger VL, Go AS, Lloyd-Jones DM, Adams RJ, Berry JD, Brown TM, et al. Heart Disease and Stroke Statistics—2011 Update. Circulation [Internet] 2011;123(4):e18–209. Available from: https://www.ahajournals.org/doi/10.1161/CIR.0b013e3182009701
4. Yan S, Gan Y, Jiang N, Wang R, Chen Y, Luo Z, et al. The global survival rate among adult out-of-hospital cardiac arrest patients who received cardiopulmonary resuscitation: a systematic review and meta-analysis. Crit Care [Internet] 2020;24(1):61. Available from: https://ccforum.biomedcentral.com/articles/10.1186/s13054-020-2773-2
5. Mills EHA, Aasbjerg K, Hansen SM, Ringgren KB, Dahl M, Rasmussen BS, et al. Prehospital time and mortality in patients requiring a highest priority emergency medical response: a Danish registry-based cohort study. BMJ Open [Internet] 2019;9(11):e023049. Available from: http://www.ncbi.nlm.nih.gov/pubmed/31753864
6. Schutte AE. Urgency for South Africa to prioritise cardiovascular disease management. Lancet Glob Heal [Internet] 2019;7(2):e177–8. Available from: https://linkinghub.elsevier.com/retrieve/pii/S2214109X18304765
7. Chin A. Sudden cardiac death in Africa. Cardiovasc J Afr [Internet] 2014;25(4):151–2. Available from: http://www.ncbi.nlm.nih.gov/pubmed/25192296

8. Stassen W, Wylie C, Djärv T, Wallis LA. Out-of-hospital cardiac arrests in the city of Cape Town, South Africa: a retrospective, descriptive analysis of prehospital patient records. BMJ Open [Internet] 2021;11(8):e049141. Available from: https://bmjopen.bmj.com/lookup/doi/10.1136/bmjopen-2021-049141
9. Berg KM, Cheng A, Panchal AR, Topjian AA, Aziz K, Bhanji F, et al. Part 7: Systems of Care: 2020 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Circulation [Internet] 2020;142(16_suppl_2):S580–604. Available from: https://www.ahajournals.org/doi/10.1161/CIR.0000000000000899
10. Sayre MR, Berg RA, Cave DM, Page RL, Potts J, White RD. Hands-Only (Compression-Only) Cardiopulmonary Resuscitation: A Call to Action for Bystander Response to Adults Who Experience Out-of-Hospital Sudden Cardiac Arrest. Circulation [Internet] 2008;117(16):2162–7. Available from: https://www.ahajournals.org/doi/10.1161/CIRCULATIONAHA.107.189380
11. Dobbie F, Angus K, Uny I, Duncan E, MacInnes L, Hasseld L, et al. Protocol for a systematic review to identify the barriers and facilitators to deliver bystander cardiopulmonary resuscitation (CPR) in disadvantaged communities. Syst Rev [Internet] 2018;7(1):143. Available from: https://systematicreviewsjournal.biomedcentral.com/articles/10.1186/s13643-018-0807-5
12. Mohammed Z, Arafa A, Saleh Y, Dardir M, Taha A, Shaban H, et al. Knowledge of and attitudes towards cardiopulmonary resuscitation among junior doctors and medical students in Upper Egypt: cross-sectional study. Int J Emerg Med [Internet] 2020;13(1):19. Available from: https://intjem.biomedcentral.com/articles/10.1186/s12245-020-00277-x
13. Rajeswaran L, Cox M, Moeng S, Tsima BM. Assessment of nurses' cardiopulmonary resuscitation knowledge and skills within three district hospitals in Botswana. African J Prim Heal Care Fam Med [Internet] 2018;10(1):e1–6. Available from: https://phcfm.org/index.php/phcfm/article/view/1633
14. Ojifinni K, Motara F, Laher AE. Knowledge, Attitudes and Perceptions Regarding Basic Life Support Among Teachers in Training. Cureus [Internet] 2019;11(12):e6302. Available from: https://www.cureus.com/articles/25582-knowledge-attitudes-and-perceptions-regarding-basic-life-support-among-teachers-in-training
15. Masoli M, Fabian D, Holt S, Beasley R. The global burden of asthma: executive summary

of the GINA Dissemination Committee Report. Allergy [Internet] 2004;59(5):469–78. Available from: https://onlinelibrary.wiley.com/doi/10.1111/j.1398-9995.2004.00526.x

16. Mortality and causes of death in South Africa: Findings from death notification [Internet]. 2018 [cited 2022 Mar 16];Available from: https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwiBrMox8v2AhWu8bsIHQopBwUQFnoECAMQAQ&url=https%3A%2F%2Fwww.statssa.gov.za%2Fpublications%2FP03093%2FP030932018.pdf&usg=AOvVaw2iOO-JSn9qz7bROZo8q8cM
17. Hung MSY, Chow MCM, Chu TTW, Wong PP, Nam WY, Chan VLK, et al. College students' knowledge and attitudes toward bystander cardiopulmonary resuscitation: A cross-sectional survey. Cogent Med [Internet] 2017;4(1):1334408. Available from: https://www.tandfonline.com/doi/full/10.1080/2331205X.2017.1334408
18. Alotaibi O, Alamri F, Almufleh L, Alsougi W. Basic life support: Knowledge and attitude among dental students and Staff in the College of Dentistry, King Saud University. Saudi J Dent Res [Internet] 2016;7(1):51–6. Available from: https://linkinghub.elsevier.com/retrieve/pii/S2352003515000295
19. First-Aid Training SA [Internet]. 2022 [cited 2022 Mar 15];Available from: https://www.firstaidtrainingsa.co.za/faq/
20. The Future of First Aid Training (Update 8) [Internet]. 2021 [cited 2022 Mar 16];Available from: https://www.saiosh.co.za/news/556944/The-Future-of-First-Aid-Training-Update-8.htm
21. Lynch B, Einspruch EL, Nichol G, Becker LB, Aufderheide TP, Idris A. Effectiveness of a 30-min CPR self-instruction program for lay responders: a controlled randomized study. Resuscitation [Internet] 2005;67(1):31–43. Available from: https://linkinghub.elsevier.com/retrieve/pii/S0300957205002157
22. Del Rios M, Han J, Cano A, Ramirez V, Morales G, Campbell T, et al. Pay It Forward: High School Video-based Instruction Can Disseminate CPR Knowledge in Priority Neighborhoods. West J Emerg Med [Internet] 2018;19(2):423–9. Available from: https://escholarship.org/uc/item/2pn6b039
23. Oteir AO, Almhdawi KA, Kanaan SF, Alwidyan MT, Williams B. Cardiopulmonary resuscitation level of knowledge among allied health university students in Jordan: a

cross-sectional study. BMJ Open [Internet] 2019;9(11):e031725. Available from: https://bmjopen.bmj.com/lookup/doi/10.1136/bmjopen-2019-031725

24. Zinckernagel L, Malta Hansen C, Rod MH, Folke F, Torp-Pedersen C, Tjørnhøj-Thomsen T. What are the barriers to implementation of cardiopulmonary resuscitation training in secondary schools? A qualitative study. BMJ Open [Internet] 2016;6(4):e010481. Available from: https://bmjopen.bmj.com/lookup/doi/10.1136/bmjopen-2015-010481
25. Sasson C, Haukoos JS, Bond C, Rabe M, Colbert SH, King R, et al. Barriers and Facilitators to Learning and Performing Cardiopulmonary Resuscitation in Neighborhoods With Low Bystander Cardiopulmonary Resuscitation Prevalence and High Rates of Cardiac Arrest in Columbus, OH. Circ Cardiovasc Qual Outcomes [Internet] 2013;6(5):550Availablefrom:https://www.ahajournals.org/doi/10.1161/CIRCOUTCOMES.111.000097
26. Blewer AL, Leary M, Fredericks AC, Andersen JC, Decker CS, Esposito EC, et al. Self-Reported Barriers to CPR Education Among Laypersons Offered Training. Circulation 2010;122(Suppl_21):A248.

RESEARCH PROTOCOL

Knowledge and attitude towards cardiopulmonary resuscitation by non-medical staff at a medical school in Gauteng.

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INTRODUCTION

Life-threatening emergencies including sudden cardiac arrest (SCA) can occur any at place, either in-or out-of-hospital and accounts for the majority of deaths globally with survival rates varying significantly from region to region.[1] Annually, out-of-hospital cardiac arrest (OHCA) is responsible for approximately 350 000 deaths in Europe and another 300 000 deaths in the United States.[2,3] The global survival rate of OHCA remains dismal at 8.8%.[4] Mortality for the most part is determined by the time lag between the onset of cardiac arrest and initiation of high quality cardiopulmonary resuscitation (CPR) and the arrival of emergency medical services (EMS).[5]

Sudden cardiac arrest has various aetiologies, with coronary artery disease representing up to 80% of cases. Studies among various segments of the South African population have revealed a high burden of risk factors for cardiovascular disease, which is likely to be associated with an increased risk of SCA.[6,7] The annual prevalence of OHCA in South Africa is estimated at 23.2 per 100 000 persons.[8]

Studies conducted in the United States between 2005 and 2010 found that 27.4% of instances of OHCA had better survival outcomes after receiving cardiopulmonary resuscitation (CPR).[9]

Furthermore, CPR performed prior to the arrival of Emergency Medical Services (EMS) dramatically increased the 30-day survival rate.[10]

CPR is a well-recognized clinical procedure performed to maintain adequate blood flow to the brain and other vital organs during cardiac arrest. The most significant actions proven to reduce mortality rates and save lives during CPR are high-quality chest compressions, early defibrillation and treating reversible causes. A study in South Africa found that when high quality CPR was performed; survival rates approached 50% following witnessed OHCA.[11]

The American Heart Association's (AHA) chain of survival for OHCA comprises of six links; namely 1) recognition of cardiac arrest and activation of the emergency response system, 2) early CPR, 3) rapid defibrillation, 4) advanced resuscitation by EMS, 5) post-cardiac arrest care and 6) recovery.[12] The first three links can be initiated by any first responder on scene who may be a trained medical person or a bystander. Minimum bystander CPR requirements include the ability to recognize a person in cardiac arrest, calling for help and initiating timeous hands-only chest compressions.[13] Barriers to laypersons performing CPR include a lack of training and fears around causing more harm than good.[14] A Japanese study investigated the relationship between EMS response times and bystander intervention after OHCA. They noted an improved 1 month neurologically intact survival when bystanders-initiated chest-compressions only and early defibrillation against varying EMS arrival times.[15]

Free public access to automated external defibrillators (AEDs) have shown an increase in the survival rates of OHCA victims.[16] The American Heart Association (AHA) has specifically promoted the development and implementation of public access defibrillation (PAD) programs after a few studies of lay rescuer AED programs in airports, casinos and AED allocations to police officers, demonstrated a 49% to 74% survival rate from OHCA when immediate bystander CPR was provided, and defibrillation occurred within 3 to 5 minutes of collapse.[17,18]

Similar to airports and casinos, South African medical schools host crowds of people in the form of visitors, students, medical as well as non-medical support staff. Non-medical support staff include administrative staff, lecturers, security, and cleaning staff. On cursory consideration, one

might be led to believe an OHCA occurring at a medical school would be met with rapid and efficient CPR and early defibrillation. This may be an incorrect assumption if the OHCA first responder is an untrained non-medical staff member.

CPR education opportunities are routinely available to health care professionals to improve their response to and survival of cardiac arrest patients in the hospital setting, but these resources are not routinely available to non–medical staff or faculty as it is not necessarily considered part of their job description.[19]

Previous studies have mainly investigated the CPR knowledge of professional medical staff in medical institutions.[20] However, only a few studies have investigated the knowledge and attitudes toward CPR by non-medical staff in medical institutions. Impedance to laypersons performing CPR include a lack of confidence in CPR technique and concerns around causing more harm than good. This fear is further exacerbated in an emergency as bystander panic plays a huge role in performing high quality CPR. It can therefore be reasonably extrapolated that non-medical staff, essentially laypersons, would suffer the same mental impedance to CPR training and performance.[14] If in future CPR training of non-medical staff in South African Medical schools became a routine or mandatory requirement, a baseline assessment of the current knowledge and attitudes towards CPR of staff would be needed.Hence this study aims to analyze the current CPR knowledge and attitudes in non-medical staff in a single medical institution in Gauteng.

AIMS AND OBJECTIVES

Study Aim

To describe the level of knowledge and attitude towards CPR by non- medical staff at a medical school in the Gauteng province in South Africa.

Objective

- To describe the demographics of the non-medical staff.
- To describe the knowledge and level of CPR training of the non-medical staff.
- To describe the attitude and perceptions of non-medical staff towards performing CPR.

METHODOLOGY

Study design

This is a descriptive observational study that will be conducted at a medical school in Gauteng. This study was conducted in one single centre University of Witwatersrand Johannesburg Medical School. With the aim to survey the knowledge and attitudes of non-medical staff such as the lecturing staff, administrative staff, cleaners and security staff toward performing CPR.

Study population and sample

The sample size will be a convenience sample. According to Human Resources, the total number of non-medical is 269. The sample size was calculated, and it is about 159. According to the PG Assessors meeting to make it 150.

Inclusion criteria

The study will include non-medical staff such as cleaners, security, lecturers, administrative and library staff.

Exclusion criteria

The study will exclude staff with medical degrees, nursing degrees, non-medical staff on leave as well as medical and allied health students.

Data collection

As the researcher I will seek approval from the faculty of health sciences and ethics Committee. The data will be collected by myself.

- During the study enrollment period, as the researcher, I will approach my target audience and explain the purpose of my research. I will provide the necessary ethics and approval documents.
- I will then provide the potential study participants with the opportunity to participate in my study. I will make it clear to all participants that participation is completely voluntary. After which participants will be handed the questionnaire to complete.

- Upon receiving the completed questionnaire from the participant, I will place the consent form and the questionnaire in an envelope which will be sealed to maintain participant anonymity as well as confidentiality.

For COVID-19 precautions: the following steps will take place:

- The researcher will wear an N95 mask.
- All the questionnaire papers and pens will be sterilized before and after.
- The researcher will be provided hand sanitizer for all the participants before and after filling the questionnaire.
- The social distancing will apply.

Non- medical staff who are currently working in medical school will be enrolled over a period of two months between August 2020 and October 2020.

Questionnaire

A multiple-choice questionnaire of will be used to assess the level of knowledge and attitude toward cardiopulmonary resuscitation (CPR) by non-medical staff. The questionnaire developed by the researcher.

The questionnaire is divided into 4 categories:

Section A: Demographic characteristics.

Section B: Medical emergencies encountered on the medical school premises.

Section C: Knowledge regarding basic CPR.

Section D: Attitudes and perceptions towards performing CPR.

A bias to consider and manage during the study would be prior staff exposure to the medical field and therefore to CPR training if they had previously worked in a hospital or clinic setting.

DATA ANALYSIS

Statistical analysis will be conducted using a Statistica software package. Descriptive analysis will be presented using tables and bar charts. Categorical variables like gender, department and education states will be summarized using frequencies and proportions. Categorical variables

will be summarized using mean and standard denotations if the data are normally distributed or using median and interquartile range (IQR) otherwise. Bivariate analysis of the knowledge categorical variables and demographic factors will be analyzed using Chi-squared test for independence to assess any association between variables. The logistic regression model for the binary knowledge outcome will be fitted to quantify and identify the possible factors which influence knowledge. The attitude of the participants will be summarized using the tables reporting frequencies and percentages. Association between attitude characteristic and demographic characteristic will also be assessed using the Chi-squared test. In all analysis, the significance level will be set at 5%. All results with a P-value <0,05 will be considered statically significant.

ETHICS

The questionnaire is self-administered, and all the participants will provide written consent after receiving an explanation of the purpose of the research. The researcher will apply to the human research ethics committee for approval for the study. Approval from the faculty of health sciences dean will also be sought.

TIMING

	JAN 2020	MAY 2020	JUN 2020	JUL 2020	AUG 2020	SEP 2020	OCT 2020	NOV 2020	DEC 2020	FEB 2021	APR 2021
Literature review											
Preparing protocol											
Protocol assessment											
Ethics application											
Collecting data											
Data analysis											
Writing up-thesis											
Writing up-paper											

FUNDING

All the costs for this study will be sponsored by the researcher. The expected budget is estimated to be between R1500 to R3000. The study participants will not be reimbursed financially for completing the survey.

LIMITATIONS

The study may miss staff members who are away on leave during the enrollment period. This study occurs during Covid-19 pandemic.

REFERENCES

1. Wong CX, Brown A, Lau DH, Chugh SS, Albert CM, Kalman JM, et al. Epidemiology of Sudden Cardiac Death: Global and Regional Perspectives. Heart Lung Circ [Internet] 2019;28(1):6–14. Available from: http://www.ncbi.nlm.nih.gov/pubmed/30482683
2. Berdowski J, Berg RA, Tijssen JGP, Koster RW. Global incidences of out-of-hospital cardiac arrest and survival rates: Systematic review of 67 prospective studies. Resuscitation [Internet] 2010;81(11):1479–87. Available from: https://linkinghub.elsevier.com/retrieve/pii/S0300957210004326
3. Roger VL, Go AS, Lloyd-Jones DM, Adams RJ, Berry JD, Brown TM, et al. Heart Disease and Stroke Statistics—2011 Update. Circulation [Internet] 2011;123(4):e18–209. Available from: https://www.ahajournals.org/doi/10.1161/CIR.0b013e3182009701
4. Yan S, Gan Y, Jiang N, Wang R, Chen Y, Luo Z, et al. The global survival rate among adult out-of-hospital cardiac arrest patients who received cardiopulmonary resuscitation: a systematic review and meta-analysis. Crit Care [Internet] 2020;24(1):61. Available from: https://ccforum.biomedcentral.com/articles/10.1186/s13054-020-2773-2
5. Mills EHA, Aasbjerg K, Hansen SM, Ringgren KB, Dahl M, Rasmussen BS, et al. Prehospital time and mortality in patients requiring a highest priority emergency medical response: a Danish registry-based cohort study. BMJ Open [Internet] 2019;9(11):e023049. Available from: http://www.ncbi.nlm.nih.gov/pubmed/31753864
6. Schutte AE. Urgency for South Africa to prioritise cardiovascular disease management. Lancet Glob Heal [Internet] 2019;7(2):e177–8. Available from: https://linkinghub.elsevier.com/retrieve/pii/S2214109X18304765

7. Chin A. Sudden cardiac death in Africa. Cardiovasc J Afr [Internet] 2014;25(4):151–2. Available from: http://www.ncbi.nlm.nih.gov/pubmed/25192296
8. Stassen W, Wylie C, Djärv T, Wallis LA. Out-of-hospital cardiac arrests in the city of Cape Town, South Africa: a retrospective, descriptive analysis of prehospital patient records. BMJ Open [Internet] 2021;11(8):e049141. Available from: https://bmjopen.bmj.com/lookup/doi/10.1136/bmjopen-2021-049141
9. McNally B, Robb R, Mehta M, Vellano K, Valderrama AL, Yoon PW, et al. Out-of-hospital cardiac arrest surveillance --- Cardiac Arrest Registry to Enhance Survival (CARES), United States, October 1, 2005--December 31, 2010. Morb Mortal Wkly report Surveill Summ [Internet] 2011;60(8):1–19. Available from: http://www.ncbi.nlm.nih.gov/pubmed/21796098
10. Hasselqvist-Ax I, Riva G, Herlitz J, Rosenqvist M, Hollenberg J, Nordberg P, et al. Early Cardiopulmonary Resuscitation in Out-of-Hospital Cardiac Arrest. N Engl J Med [Internet] 2015;372(24):2307–15. Available from: http://www.nejm.org/doi/10.1056/NEJMoa1405796
11. Veronese J-PT. An assessment of theoretical knowledge and psychomotor skills of Basic Life Support Cardio-Pulmonary Resuscitation provision by Emergency Medical Services in a province in South Africa. 2015;
12. Berg KM, Cheng A, Panchal AR, Topjian AA, Aziz K, Bhanji F, et al. Part 7: Systems of Care: 2020 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Circulation [Internet] 2020;142(16_suppl_2):S580–604. Available from: https://www.ahajournals.org/doi/10.1161/CIR.0000000000000899
13. Sayre MR, Berg RA, Cave DM, Page RL, Potts J, White RD. Hands-Only (Compression-Only) Cardiopulmonary Resuscitation: A Call to Action for Bystander Response to Adults Who Experience Out-of-Hospital Sudden Cardiac Arrest. Circulation [Internet] 2008;117(16):2162–7. Available from: https://www.ahajournals.org/doi/10.1161/CIRCULATIONAHA.107.189380
14. Dobbie F, Angus K, Uny I, Duncan E, MacInnes L, Hasseld L, et al. Protocol for a systematic review to identify the barriers and facilitators to deliver bystander cardiopulmonary resuscitation (CPR) in disadvantaged communities. Syst Rev [Internet] 2018;7(1):143. Available from:

https://systematicreviewsjournal.biomedcentral.com/articles/10.1186/s13643-018-0807-5

15. Goto Y, Funada A, Goto Y. Relationship Between Emergency Medical Services Response Time and Bystander Intervention in Patients With Out-of-Hospital Cardiac Arrest. J Am Heart Assoc [Internet] 2018;7(9):e007568. Available from: https://www.ahajournals.org/doi/10.1161/JAHA.117.007568
16. Basanta Camiño S, Navarro Patón R, Freire Tellado M, Barcala Furelos R, Pavón Prieto MP, Fernández López M, et al. Assessment of knowledge and skills in using an Automated External Defibrillator (AED) by university students. A quasi-experimental study. Med Intensiva [Internet] 2017;41(5):270–6. Available from: https://linkinghub.elsevier.com/retrieve/pii/S2173572717300930
17. Weisfeldt ML, Kerber RE, McGoldrick RP, Moss AJ, Nichol G, Ornato JP, et al. Public Access Defibrillation. Circulation [Internet] 1995;92(9):2763–2763. Available from: https://www.ahajournals.org/doi/10.1161/01.CIR.92.9.2763
18. Hazinski MF, Idris AH, Kerber RE, Epstein A, Atkins D, Tang W, et al. Lay Rescuer Automated External Defibrillator ("Public Access Defibrillation") Programs. Circulation [Internet] 2005;111(24):3336–40. Available from: https://www.ahajournals.org/doi/10.1161/CIRCULATIONAHA.105.165674
19. Sodersved Kallestedt ML, Rosenblad A, Leppert J, Herlitz J, Enlund M. Hospital employees' theoretical knowledge on what to do in an in-hospital cardiac arrest. Resuscitation [Internet] 2010;81(2):S107. Available from: https://linkinghub.elsevier.com/retrieve/pii/S0300957210009159
20. Rajeswaran L, Cox M, Moeng S, Tsima BM. Assessment of nurses' cardiopulmonary resuscitation knowledge and skills within three district hospitals in Botswana. African J Prim Heal Care Fam Med [Internet] 2018;10(1):e1–6. Available from: https://phcfm.org/index.php/phcfm/article/view/1633

APPENDIX 1: STUDY INFORMATION SHEET

Study title*: Knowledge and attitude towards cardiopulmonary resuscitation by non-medical staff at a medical school in Gauteng.*

Introduction

Good day!
My name is Saeb Jarghon. I am one of the Registers in Emergency Medicine at the University of the Witwatersrand. To complete my post-graduate degree, I am required to do a M Med research project. The title of my M Med study is "Knowledge and attitude towards cardiopulmonary resuscitation by non-medical staff at a medical school in South Africa"

Voluntary participation

I am inviting you to assist me with this study by filling in a questionnaire. Participation in this survey is completely voluntary. If you do not want to take part, you are free to say "no." This will have no effect on your employment at the University, or any other aspect of your life.

What is cardiopulmonary resuscitation?

Cardiopulmonary resuscitation is an emergency procedure given to a person who has collapsed because of suspected heart trouble. It combines chest compressions, often with artificial ventilation, in an effort to manually preserve intact brain function until further measures are taken to restore spontaneous blood circulation and breathing. In certain instances, it can mean the difference between life and death.

Methodology

I am researching the level of knowledge of cardiopulmonary resuscitation for non-medical staff in this institution via the use of a questionnaire. This questionnaire will not ask anyone to enter his or her name, or any other identifying information, so you may be assured that if you decide to participate, your responses will remain anonymous. I will leave copies of the questionnaire in your department, together with a box for the collection of completed questionnaires and come back later to empty the box.
All completed questionnaires will be kept in a secure location. The data will be captured onto a Microsoft Excel document and will only be accessed by myself, my supervisors, and a statistician.

What you are asked to do

If you agree to take part in my research, please read through each question and choose the most appropriate answer in the corresponding tick box. The questionnaire should take no more than 10 minutes of your time. Permission to perform this research has been granted by the Dean of Faculty of Health Sciences.

Cost and payment

There is neither cost nor payment involved in taking part in my study.

Results

If you would be interested in a summary of the results of my study, please let me know.

Further information
If you would like any further information regarding my M Med or this questionnaire, please feel free to contact me or my supervisors, Dr. K Molokoane or Professor F Motara.
Please see the contact information below:

Primary Researcher: Dr Saeb Jarghon,062 260 4269, drsaeber@gmail.com
Supervisor 1: Dr K Molokoane, 079 873 3925, Molokoane-kamo@yahoo.co.uk
Supervisor 2: Professor F Motara, 076 130 2693, feroza.motara@wits.ac.za

This study has been approved by the Human Research Ethics Committee (Medical) of the University of the Witwatersrand, Johannesburg ("Committee"). A principal function of this Committee is to safeguard the rights and dignity of all human subjects who agree to participate in a research project and the integrity of the research.

If you have any concern over the way the study is being conducted, please contact the Chairperson of this Committee who is Dr Clement Penny, who may be contacted on telephone number 011 717 2301, or by e-mail on Clement.Penny@wits.ac.za. The telephone numbers for the Committee secretariat are 011 717 2700/1234 and the e-mail addresses are Zanele.Ndlovu@wits.ac.za and Rhulani.Mukansi@wits.ac.za

Thank you for reading this Study Information Sheet.

September 2020

APPENDIX 2: STUDY QUESTIONNAIRE

SECTION A: DEMOGRAPHIC CHARACTERISTICS

1	Department employed at medical school?	
2	Age at last birthday	
3	Gender	□ Male □ Female □ Other
4	Highest level of schooling (education)?	□ Primary school □ Secondary School □ High School □ College □ University □ Postgraduate
5	How many years have you worked at medical school?	□ < 6 months □ 6-12months □ 1-5years □ 5-10years □ >10years

SECTION B: MEDICAL EMERGENCIES SEEN ON THE MEDICAL SCHOOL PREMISES (Mark **X** in the appropriate box)

Have you witnessed any of these emergencies during your years working at the medical school?		Never	At least once	At least once a year
6	Someone suffering from a Stroke			
7	Someone suffering from a Heart attack			
8	Someone choking (a blockage of the upper breathing pipe by food or other objects)			
9	Someone having difficulty breathing			
10	Someone having seizures (fits, convulsions)			
11	Have you ever witnessed someone collapse?			

SECTION C: KNOWLEDGE ABOUT BASIC LIFE SUPPORT (Hands-only CPR, AED)
Circle the most appropriate option.

12	What is the first thing to look out for during a medical emergency?	A. If the person is unconscious B. If the person is breathing and has a pulse C. If I am in danger D. I don't know
13	What are the 2 steps of Hands-only CPR?	A. Call for help and start chest compressions B. -Call for help and wait for the emergency medical services to arrive C. Provide chest compressions and mouth-to-mouth breaths D. I don't know
14	Do you know the phone number for the Charlotte Maxeke Johannesburg	

	Academic Hospital Emergency Department CMJAH ED (Casualty)?	
15	Where would you place your hands to do Hands-only chest compressions?	A. Upper part of the breastbone B. Middle of the breastbone C. Lower part of the breastbone D. I don't know
16	Which of the following are signs of high-quality (good) Hands-Only CPR?	A. Push Hard B. Push Fast C. Push at a rate of 100-120 compressions per minute D. All of the above
17	Which of the following persons requires Hands-only CPR?	A. A person with a pulse but trouble breathing B. A person who is unresponsive with no normal breathing and no pulse C. A person who is unresponsive but is breathing normally D. I don't know
18	When should you stop giving Hands-Only CPR?	A. When emergency medical staff arrive B. If the person speaks, moves, or breathes normally C. If the scenario becomes dangerous D. All of the above
19	How does an Automated External Defibrillator (AED) help a person in cardiac arrest?	A. An AED pumps blood B. An AED shocks the brain C. An AED helps the victim breathe D. An AED restores normal heart rhythm
20	Do you know where the AED is located in the medical school building?	
21	Who is qualified to perform Hands-Only CPR?	A. Anyone B. Only Emergency staff C. Teachers D. Coaches
22	Who is the first aid officer (occupational health and safety officer) in your department and how do you contact them?	

SECTION D: ATTITUDE AND PERCEPTION ABOUT EMERGENCIES

23	**Have you ever performed CPR before?**	Yes	No
	If you answered No, please consider options 23(a)-23(d) and choose the most applicable answer		
	If you answered Yes for question 23, skip to question 24		
23(a)	I have never needed to perform CPR on anyone		
23(b)	I don't know how to do CPR		
23(c)	I know how to perform CPR but I'm too scared		
23(d)	Other reasons (please specify): _____ _____		
24	**Have you ever had formal CPR training?**	Yes	No
	If you answered No, please consider options 24(a)-24(d) and choose the most applicable answer		
	If you answered Yes to question 24, skip to question 25		
24 (a)	I am not a health care provider	Yes	No
24(b)	I never thought about it	Yes	No
24(c)	It costs money	Yes	No
24(d)	I do not know where to go for the training	Yes	No
24(e)	Other reasons (please specify): _____ _____		
25	**Would you like to have CPR training?**	Yes	No
26	Do you think CPR training should be **mandatory** for everyone who works at medical school?	Yes	No
27	Do you think your employer should pay for the CPR training for you?	Yes	No
28	Do you think you would directly benefit from staff CPR training	Yes	No

Thank you for your participation!

ETHICS CLEARANCE CERTIFICATE

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

R14/49 Drs S Jargohn and K Molokoane

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
CLEARANCE CERTIFICATE NO. M200632

NAME: (Principal Investigator)	Drs S Jargohn and K Molokoane
DEPARTMENT:	School of Clinical Medicine Department of Medicine Division of Emergency Medicine Medical School University
PROJECT TITLE:	Knowledge and attitude towards cardiopulmonary resuscitation by non-medical staff at a medical school in Gauteng
DATE CONSIDERED:	2020/06/26
DECISION:	Approved unconditionally
CONDITIONS:	
SUPERVISOR:	Professor F Motara
APPROVED BY:	Dr CB Penny, Chairperson, HREC (Medical)
DATE OF APPROVAL:	2020/08/25

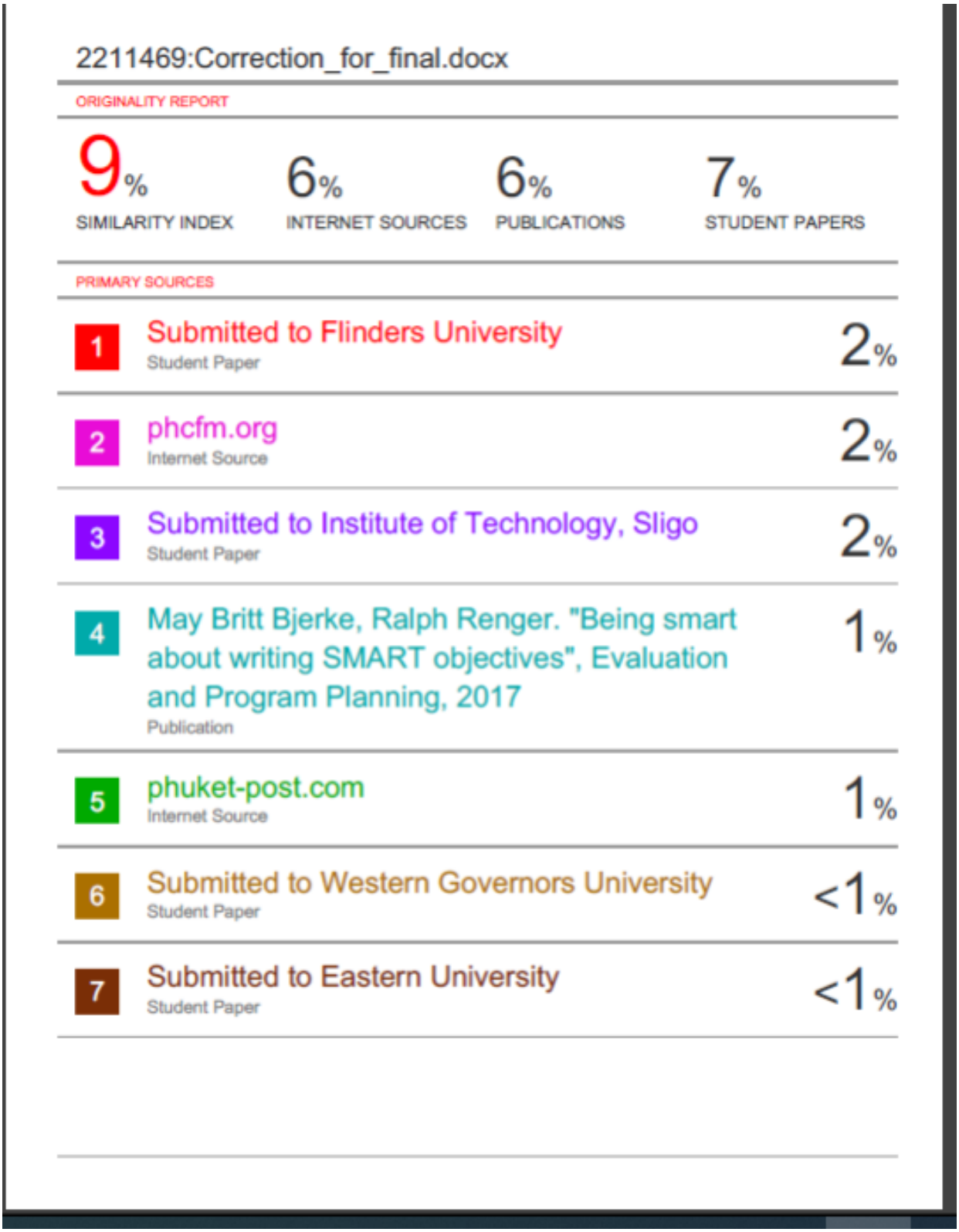
This clearance certificate is valid for 5 years from the date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office Secretary on the 3rd Floor, Phillip Tobias Building, Parktown, University of the Witwatersrand, Johannesburg.
I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated, from the research protocol as approved, I/we undertake to submit details to the Committee. **I agree to submit a yearly progress report**. When a funder requires annual re-certification, the application date will be one year after the date when the study was initially reviewed. In this case, the study was initially reviewed in **June** and will therefore reports and re-certification will be due early in the month of **June** each year. Unreported changes to the application may invalidate the clearance given by the HREC (Medical).

Principal Investigator Signature _____ Date _____

TURN-IT-IN REPORT



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PLAGIARISM DECLARATION

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

FACULTY OF HEALTH SCIENCES

PLAGIARISM DECLARATION TO BE SIGNED BY ALL HIGHER DEGREE STUDENTS

SENATE PLAGIARISM POLICY: APPENDIX ONE

I Saeb Jurshon (Student number: 2211469) am a student registered for the degree of Master in Emergency medicine in the academic year 3.

I hereby declare the following:

- I am aware that plagiarism (the use of someone else's work without their permission and/or without acknowledging the original source) is wrong.
- I confirm that the work submitted for assessment for the above degree is my own unaided work except where I have explicitly indicated otherwise.
- I have followed the required conventions in referencing the thoughts and ideas of others.
- I understand that the University of the Witwatersrand may take disciplinary action against me if there is a belief that this is not my own unaided work or that I have failed to acknowledge the source of the ideas or words in my writing.
- I have included as an appendix a report from "Turnitin" (or other approved plagiarism detection) software indicating the level of plagiarism in my research document.

Signature:  Date: 22 JULY 2021

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