




Assessing emergency care providers' eligibility for progression to higher qualifications

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Background. Emergency care (EC) education in South Africa (SA) has traditionally focused on vocational short-course training, leaving EC providers lacking formal EC qualifications. Legislative changes have introduced a three-tiered qualification system aligning with international and national standards. This system includes a 1-year higher certificate, a 2-year diploma, and a 4-year professional degree in emergency medical care (EMC).

Objectives. To evaluate whether current EC providers working in Limpopo Province, SA, meet the educational requirements to transition to the new National Qualification Framework (NQF)-aligned EMC qualifications.

Methods. This study employed a retrospective, quantitative, descriptive design, conducted as a desktop exercise involving EC providers working for the Limpopo state-owned Emergency Medical Service (EMS) in the Capricorn District. Using a total population sampling approach, relevant documents from the archive storeroom were included for all qualified EC providers in the Capricorn District.

Results. Of the 319 participants, 99.4% ($n=317$) completed matric, while 0.6% did not. The majority (56.5%, $n=180$) of participants were basic ambulance assistants, mostly male (61.1%) and aged 40 - 49 years (56.4%). For the higher certificate programme, 97.2% ($n=308$) did not meet the mathematics requirement, either because it was not one of their subjects or they did not achieve the required symbol. Similarly, 88.3% ($n=280$) did not meet the biology requirement, 98.1% ($n=311$) did not meet the physical science requirement, while 55% ($n=174$) met the English requirement. For the diploma programme, 98.4% ($n=312$) did not meet the mathematics requirement, 98.7% ($n=313$) did not meet the biology requirement, 99.7% ($n=316$) did not meet the physical science requirement, and 86.8% ($n=275$) did not meet the English requirement.

For the Bachelor's degree programme, 99.4% ($n=315$) did not meet the mathematics requirement, 98.7% ($n=313$) did not meet the biology requirement, 100% ($n=317$) did not meet the physical science requirement, and 87.1% ($n=276$) did not meet the English requirement. Only three participants met the criteria for the higher certificate programme. None met the criteria for the diploma or Bachelor's degree programme.

Conclusion. Most EC providers do not meet the prerequisite subject and symbol requirements for entry into EMC programmes. None of the participants qualified for the diploma or Bachelor's degree programmes, and only three met the criteria for the higher certificate. This highlights educational barriers that hinder career progression for EC providers. Bridging these gaps through matric upgrade programmes, recognition of prior learning and bridging programmes is crucial to expanding access to higher education.

Keywords. xx

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An emergency medical service (EMS) is a crucial component of a healthcare system, often serving as the first point of contact for patients during their most critical and vulnerable moments.^[1] EMS is provided by emergency care (EC) providers who deliver essential medical and trauma-related care. The role of EC providers is critical in responding to emergencies and ensuring prompt, appropriate care. Typically, such professionals assess and manage patient conditions, and provide life-saving interventions at the scene before transporting patients safely to healthcare facilities.^[2] The quality of EMS is directly linked to the education and training of these professionals.^[3] The training and education of EC providers in South Africa (SA), as in many other countries, have long centred around vocational short courses and on-the-job training rather than formalised tertiary education.^[4,5] Before 2016, EC education and training primarily followed a short-course training approach, comprising a 4 - 5-week Basic Ambulance Assistant (BAA) course, a 12-week Ambulance Emergency Assistant (AEA) course,

and a 9 - 10-month Critical Care Assistant (CCA) course.^[6] It became apparent that the short-course model was not aligned with the Higher Education Qualifications Sub-Framework (HEQSF).^[7] This misalignment has arisen owing to several factors. One of the primary contributors was the academic design of EC short courses, which did not conform to the standards set by the National Qualification Framework (NQF),^[6] which posed a significant obstacle to recognising these courses within the broader educational framework.^[7] Furthermore, EC short courses failed to meet the SA Qualification Authority (SAQA) requirements for formal qualifications, which added to the challenge. There was a substantial knowledge gap between the non-credit-bearing EC short-course qualifications and higher education EC qualifications.^[8] This knowledge gap meant that individuals who completed short courses did not possess the comprehensive knowledge expected at the higher education level, further complicating the alignment process.^[8]

In January 2017, a legislative decision was made by the National Department of Health (NDoH) to discontinue all EC short courses.^[4,6] This decision significantly changed the country's EC education and training landscape. It signalled the end of an era of EC short courses and advanced higher education EC qualifications.^[5] The historic short-course qualifications have been replaced with the three-tiered EC qualifications that are aligned with the relevant SA education legislations, i.e. the HEQSF, the Higher Education Act of 1997, the National Qualification Framework Act of 2008, and the National EC Education and Training (NECET) policy.^[4] These three-tiered qualifications have been developed to professionalise the EC profession and allow smooth vertical mobility from one qualification to another. Tertiary institutions currently offer a higher certificate, a diploma, and a Bachelor's degree in emergency medical care (EMC).^[9] Personnel can continue to complete Master's and Doctorate qualifications.

While the NECET policy promotes the upgrading of EC qualifications to align with higher education standards, a challenge remains, as some EC providers lack formal qualifications, having completed only short training courses. Prior to 2012, a matric certificate was not required for admission to these short courses. However, admission to higher certificate, diploma or Bachelor's degree programmes in EMC requires prospective students to meet specific entry requirements, including holding a matric certificate and achieving the required symbols in English, mathematics, physical science and/or biology (currently known as life sciences). The primary aim of this study was to evaluate whether existing EC providers meet the entry requirements for the NQF-aligned EMC programmes.

Methods

Study design

A retrospective quantitative research design was employed, using data from the Limpopo Department of Health to analyse whether existing EC providers have the requirements to enter different EMC programmes. The study was conducted as a desktop exercise and targeted a total of 379 EC providers employed by the state-run EMS in the Capricorn District of Limpopo Province, SA. However, only 355 files were available for analysis. After conducting a data screening process, 36 files were excluded owing to invalid data, such as missing secondary school or EC documentation. This resulted in a final sample of 319 EC providers, which represents 84.2% of the original target population. The study included EC providers who held short-course qualifications in EC as BAAs, AEAs and CCAs in the Capricorn District and were registered with the Health Professions Council of South Africa (HPCSA). The retrospective data collected included participants' age, sex and highest grade passed at school. EC providers who were not based in the Capricorn District or who lacked the necessary data were excluded from the study.

Instrument

The first author collected the data from 27 February to March 2023. Relevant information, including copies of identification documents, matriculation certificates, and EC qualifications, was obtained from the Human Resources Management unit, Limpopo Department of Health. These documents were scanned using a CamScanner application (INTSIG Information Co. Ltd, China) on the researcher's password-protected tablet. The CamScanner application was used to digitise these documents, converting them into portable document format (PDF) files. These digital files were securely transferred to the researcher's password-protected laptop for analysis. The

data were then entered into a data collection template designed in Microsoft Excel 2016 (Microsoft Corp., USA).

In the Excel spreadsheet, data were organised according to a predefined framework, distinguishing between compulsory and non-compulsory subjects. Compulsory subjects included mathematics, English and either biology or physical science - subjects required for admission into higher education EC programmes. Non-compulsory subjects consisted of one's home language and additional subjects. A separate column was created for each subject, listing symbols that participants attained in their matric final examinations. The spreadsheet also indicated whether a participant passed or failed matric. A student passed if they achieved the required symbols to meet the educational standards for higher education, and failed if the standards were not met. All the participants received secondary education (senior certificate (SC) syllabus before 2009). To earn the SC under this syllabus, candidates needed to:

- Complete six subjects.
- Pass three subjects, with a minimum of 40%, including one official language at the home language level.
- Achieve at least 30% in two subjects, including one official language at the additional or home language level.
- Obtain a minimum aggregate of 720 marks (40%), known as the S-symbol (SC).

Candidates who scored ≥ 950 marks (50%) and achieved at least 20% in the sixth subject were awarded a pass mark with endorsement, indicating eligibility for higher education.

The eligibility for EMC programmes is determined by achieving specific symbols in compulsory subjects. For a higher certificate, students must have achieved a symbol E in higher grade (HG) or a D in standard grade (SG) (40 - 49%). A diploma requires a symbol D in HG or a C in SG (50 - 59%), while a Bachelor's degree requires a symbol C in HG or a B in SG (60 - 69%).

Data analysis

Descriptive statistics were used to analyse the data. The assessment examined whether participants met the entry requirements for a higher certificate, diploma or degree programmes in EMC, focusing on matric completion and specific minimum symbols in English, mathematics and biology or physical science. Admission requirements were based on those used by the Durban University of Technology (DUT) and the University of Johannesburg (UJ) for degree programmes, while diploma and higher certificate programmes followed criteria from UJ and Sefako Makgatho University (SMU).

Ethical approval

Ethical approval was granted by the Durban University of Technology (ref. no. IREC 234/22) and the Limpopo Department of Health (ref. no. LP_2022_11_002) through the National Health Research Database (NHRD).

Results

Demographic data are shown in Table 1. A total of 319 participants were included after 36 were excluded owing to lack of secondary school or EC documentation. Most (56.5%, $n=180$) participants were BAAs, with 61.1% male and 180 (56.4%) between 40 and 49 years old. Of the participants, 317 (99.4%) completed matric, while 2 (0.6%) did not pass matric. Table 2 shows the percentage of EC providers who met/did not meet the entry

requirements in three compulsory subjects, i.e. mathematics, English and biology or physical science across three levels of EMC programmes: the higher certificate, diploma and Bachelor's degree. The results of this study indicate whether current EC providers meet these academic thresholds. For the higher certificate, 308 (97.2%) did not meet the mathematics criteria, 280 (88.36%) did not meet the biology criteria and 311 (98.1%) did not meet the physical science criteria, while 174 (55%) met the English requirements. For the diploma, 312 (98.4%) did not meet the mathematics criteria,

313 (98.7%) did not meet the biology criteria, 316 (99.7%) did not meet the physical science criteria and 275 (86.8%) did not meet the English criteria. For the degree programme, 315 (99.4%) did not meet the mathematics criteria, while 2 (0.6%) met the criteria, and 313 (98.7%) did not meet the biology criteria, while 4 (1.3%) met the criteria. None of the 317 participants who completed matric met the criteria for physical science, and 276 (87.1%) did not meet the criteria for English, whereas 41 (12.9%) met the criteria. Table 3 illustrates that none of the participants met the diploma and Bachelor's degree programme criteria. Only 3 participants (0.9%) met the required criteria in 3 compulsory subjects.

Table 1. Demographic data of participants

Demographics	n (%)
Sex	
Male	195 (61.1)
Female	124 (38.9)
Total	319 (100)
Race	
Black	318 (99.7)
White	1 (0.3)
Total	319 (100)
Age group, years	
30 - 39	54 (17)
40 - 49	180 (56.4)
50 - 59	84 (26.3)
60 - 65	1 (0.3)
Total	319 (100)
Emergency care qualifications	
BAA	180 (56.5)
AEA	136 (42.6)
CCA	3 (0.9)
Total	319 (100)
Highest standard/grade obtained	
Grade 12	317 (99.4)
<Grade 12	2 (0.6)
Total	319 (100)

BAA = Basic Ambulance Assistant; AEA = Ambulance Emergency Assistant; CCA = Critical Care Assistant.

Discussion

To our knowledge, this study is the first to analyse the eligibility of existing EC providers to access higher education qualifications within the new EC framework based on their school-leaving results. The study found that most (56.5%) EC providers were BAAs, while 42.6% were AEAs. These findings differ from those of Tiwari *et al.*,^[10] who reported an even more distinct dominance of the BAA qualification at 76%, followed by AEAs at 18%, within the EC landscape. This discrepancy highlights prevailing trends in the qualifications held by EC providers in SA. The dominance of BAAs and AEAs in the current study highlights the need to address barriers preventing these professionals from transitioning into higher education qualifications. Historically, the BAA course, lasting 4 weeks, served as an entry point into the EMS profession until 2016.^[11] Before 2012, it was not compulsory for BAA course applicants to possess a matric certificate, allowing anyone, regardless of secondary school education, to enrol.^[11] Moreover, specific subject prerequisites were not compulsory for matric certificate holders seeking admission to the BAA course. However, with new EMC programmes, specific minimum entry requirements ought to be met.^[12] Meeting these requirements remains challenging for many EC providers, mainly in subjects such as English, mathematics and biology or physical science, which are compulsory for EMC programme eligibility. These minimum entry requirements pose a challenge similar to those observed in the nursing field. Crowley and Daniels^[13] identified articulation gaps in nursing education, noting that many postgraduate programme applicants were ineligible owing to

Table 2. Criteria for each subject for a higher certificate, diploma or Bachelor's degree

Subject and criteria	Higher certificate, n (%)	Diploma, n (%)	Bachelor's degree, n (%)
Mathematics			
Do not meet criteria	308 (97.2)	312 (98.4)	315 (99.4)
Meet criteria	9 (2.8)	5 (1.6)	2 (0.6)
Total	317 (100)	317 (100)	317 (100)
Biology			
Do not meet criteria	280 (88.3)	313 (98.7)	313 (98.7)
Meet criteria	37 (11.7)	4 (1.3)	4 (1.3)
Total	317 (100)	317 (100)	317 (100)
Physical science			
Do not meet criteria	311 (98.1)	316 (99.7)	317 (100)
Meet criteria	6 (1.9)	1 (0.3)	0 (0)
Total	317 (100)	317 (100)	317 (100)
English			
Do not meet criteria	143 (45.0)	275 (86.8)	276 (87.1)
Meet criteria	174 (55.0)	42 (13.2)	41 (12.9)
Total	317 (100)	317 (100)	317 (100)

holding legacy diploma qualifications that did not meet the NQF Level 7 standard. The EC profession faces a similar challenge as it transitions from older qualifications to new education standards. This alignment gap, stemming from historical training pathways without prerequisite subjects, mirrors the barriers that nursing professionals encounter as they adapt to formal qualification frameworks.

Most of the EC providers in this study ($n=317$, 99.4%) had passed matric, which is a positive finding compared with Malatjie's^[14] study in Limpopo, where ~80% of EC providers held matric qualifications. This difference may have been influenced by variations in the scope of the studies. While Malatjie's research covered all districts in Limpopo - Capricorn, Mopani, Vhembe, Waterberg and Sekhukhune - this study focused solely on the Capricorn District. Additionally, our study was conducted more recently, in February and March 2023, whereas Malatjie's study was performed between August and October 2021. The differences in geographical scope and study period may reflect differences in educational qualifications among EC providers across Limpopo districts. As indicated, most higher education institutions require a matriculation pass that meets predetermined criteria, such as passing with an exemption or attaining a specific number of distinctions.^[15] However, most EC providers in this study still lacked the requisite subject combinations for EMC programmes. Compared with the nursing field, many applicants to new postgraduate programmes also fail to meet the requirements, despite holding a matric or equivalent qualification.^[13] The majority ($n=269$, 84.9%) studied subjects irrelevant to the EC field. These findings align with observations by Nell,^[4] who noted that most existing EC providers lack the subject combinations - mathematics, English and physical science or biology - required for EMC programmes. This situation may be attributed to historical factors, when the BAA qualification was the primary gateway to the EMS profession, as most people entering the EMS field followed the vocational qualification route for training, which did not have a set of prerequisite subjects. Thus, this historical context has led to the current challenge of EC providers lacking subject combinations required for entry into various EMC programmes.

Table 3. Criteria for all three compulsory subjects for a higher certificate, diploma or Bachelor's degree

Programme and criteria*	n (%)
Higher certificate	
Do not meet criteria in all three subjects	124 (39.1)
Meet criteria in one subject	164 (51.8)
Meet criteria in two subjects	26 (8.2)
Meet criteria in three subjects	3 (0.9)
Total	317 (100)
Diploma	
Do not meet criteria in all three subjects	269 (84.9)
Meet criteria in one subject	44 (13.8)
Meet criteria in two subjects	4 (1.3)
Total	317 (100)
Bachelor's degree	
Do not meet criteria in all three subjects	272 (85.8)
Meet criteria in one subject	43 (13.6)
Meet criteria in two subjects	2 (0.6)
Total	317 (100)

*The criteria for admission to a higher certificate, diploma or Bachelor's programme in emergency medical care include achieving the required subject symbols (under the pre-2009 matriculation system) in at least 3 or 4 subjects.

Many EC providers in this study did not meet the formal prerequisites for direct entry into higher education programmes, particularly in mathematics and physical science. The findings showed that only 9 participants (2.8%) passed mathematics and 6 (1.9%) passed physical science, highlighting the challenges in meeting entry requirements for further education in this field. Even though most EC providers had a matric qualification, subject combination and subject symbols play a crucial role for individuals seeking to enter tertiary education, particularly in specialised fields such as the EC profession.

The study revealed that no participants met the criteria for entering diploma and Bachelor degree EMC programmes, while only 3 met the higher certificate programme criteria. These findings concur with those of Sobuwa and Christopher,^[5] who suggested that many EC providers do not meet higher education admission criteria. Given the findings of this study, it is evident that most EC providers will possibly face educational barriers when seeking to access new EMC programmes, such as transitioning the existing EC providers to the new EC qualifications through direct access. This is a stark reality, despite the development of the NECET policy aimed at aligning EMC training and education with the current higher education legislation and the national training needs. However, this issue is not exceptional to the EC profession, but has also been observed in nursing and other allied health sciences, where structured frameworks such as matric upgrade, bridging programmes and recognition of prior learning (RPL) have been introduced to facilitate career progression.^[16,17] Given the growing need to implement education models for academic progression in the EC profession, valuable lessons can be learnt from the nursing profession, where similar qualification transitions have been successfully managed through these frameworks.^[18] These structured approaches help bridge the gap between short-course training and higher education qualification requirements. By adopting such models, the EMS sector can facilitate a smoother transition for its workforce, while maintaining and enhancing the quality of EMC. While the study was conducted in the largest district in Limpopo, the findings may not be generalisable to other settings. Nonetheless, the implications are clear: just as in nursing, clear articulation pathways such as bridging programmes and RPL may be necessary to support the migration of current EC providers to formal qualifications.

Study limitations

This study has several limitations. The participants were limited to EC providers from one district in Limpopo, which may not reflect the broader population of EMS personnel nationally. Accordingly, the results may not be generalisable to other settings across SA. Future studies should consider addressing these limitations by including larger, more diverse samples and adopting mixed-methods approaches to enhance the generalisability and depth of the findings.

Conclusion

Many EC providers did not have the prerequisite subjects for entry into EMC programmes, and those who did, lacked the specific subject symbols. None of the participants met the criteria for admission to the diploma or Bachelor's degree EMC programmes, while only 3 met the requirements for the higher certificate programme. These findings highlight a barrier that limits existing EC providers' access to EMC programmes, thereby hindering career progression. To address this challenge, a multifaceted approach is needed. This could include developing bridging courses to help EC

providers meet entry requirements, and the expansion of RPL opportunities at higher education institutions. This approach could allow experienced EC providers to gain access to formal education pathways, acknowledging their skills and experience. Similar strategies have been successfully implemented in other healthcare sectors, suggesting that a co-ordinated policy response could facilitate greater access to higher education and career advancement in the EMS field.

Data availability. The data that supports the findings of this study were obtained from the Human Resources Management unit, Limpopo Department of Health. Because of the sensitive and confidential nature of personnel records, the data are not publicly available. Access to the data may be granted upon reasonable request and with permission from the Limpopo Department of Health.

Declaration. None.

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Author contributions. PS conceptualised the study, collected the data and drafted the manuscript, while SS and GC were responsible for critical revision of the article. Both approved the final version.

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Conflicts of interest. None.

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