



## ORIGINAL ARTICLE

# The views and experiences of candidates and graduates from a South African emergency medicine doctoral programme

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## ABSTRACT

**Introduction:** With the emergency medicine speciality in its nascency in Africa, EM doctoral programmes will need to be developed to facilitate the establishment of an evidence base that is responsive to the African populace. This study aimed to understand the thoughts, experiences, and opinions of current and past candidates of a South African EM PhD programme.

**Methods:** Descriptive, qualitative, semi-structured interviews were used to gather data on PhD EM candidates and graduates.

**Findings:** Four candidates, and four graduates were interviewed. Four categories emerged from the data 1) interviewees had various motivations for starting a PhD in EM, 2) candidate expectations and learning needs were not always aligned with reality, and the challenges and opportunities for success in the PhD programme are related both 3) intrinsically (candidate) and 4) extrinsically (system).

**Discussion:** Many of the barriers noted by the participants can be related to the nascency of the EM in Africa. Participants felt underprepared for their doctorate in terms of their baseline research literacy and skill. Candidates did not receive the level of student-supervisor engagement they desired. Candidates who are also clinicians faced both academic challenges and a resource-limited healthcare system. Pre-doctoral training may upskill prospective candidates in research literacy before they officially register. Distance-learning can be sub-optimal in terms of social interaction and collaboration. A well-curriculated, competency-based programme with clear outcomes, structured teaching-learning opportunities, intentional academic support throughout the programme, can mitigate the above. Protected academic time, promotion criteria which acknowledges academic contributions, financial incentives and more joint positions between universities and clinical services are potential solutions for clinician researcher challenges. An African PhD EM programme should produce graduates who are independent researchers, skilled in academic supervision and who are impactful to African needs when contributing to the African EM knowledge economy.

## African relevance

- While Africa accounts for a significant proportion of the world's population and disease and injury burden, it produces less than 1% of the total research output within emergency care.
- The top-cited barriers to conducting emergency care research on the African continent are lack of research training, lack of time to conduct research, and lack of research mentorship and supervision.
- The establishment of well-funded and structured doctoral programmes in emergency medicine may overcome these barriers.
- A critical mass of doctoral graduates has been shown to affect economic development, advancement of society and improvement in the quality and frequency of research outputs in multiple settings.

## Introduction

It has been demonstrated that by investing in emergency care systems strengthening over half of deaths and one-third of disability from conditions that are amenable to emergency care may be prevented [1]. Contextually relevant evidence generation is absolutely essential to provide the knowledge base to guide emergency care systems strengthening. Yet, while Africa accounts for a significant proportion of the world's disease and injury burden, it contributes less than one percent of the total research output within the emergency care field [2]. Similarly, inequality in health research outputs have been shown to contribute to inequalities in health [3]. Reducing health inequalities is a key goal of any health system and central to achieving Universal Health Coverage (UHC) [4,5].

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The top cited barriers to conducting emergency care research on the African continent is lack of research training, lack of time to conduct research, and lack of research mentorship and supervision [2]. The establishment of well-funded and structured doctoral programmes in emergency medicine may overcome many of these barriers. A critical mass of doctoral graduates has been shown to affect economic development, advancement of society and improvement in the quality and frequency of research outputs in many settings [6–11], but, this is easier said than done.

To ensure successful throughput of doctoral graduates it is essential to continually strive to develop doctoral programmes that are responsive to the learning needs of PhD candidates, and to overcome barriers to learning. It is especially important considering that building academic emergency care capacity in Africa will also mean that the limited clinician resources will need to be enrolled and cannot be extracted from clinical service. Any planned ventures will therefore need to ensure the continuation of clinical and academic functions. While the speciality of emergency medicine is in its nascency in Africa, emergency medicine doctoral programmes will certainly need to be established in order to support the academic project of establishing an African evidence base that originates from, and is responsive to the needs of our people, our patients, and our contexts.

The PhD programme in Emergency Medicine, from the Division of Emergency Medicine at the University of Cape Town registered its first candidate circa 2009. Since then, the programme has been expanding and now accepts global candidates. It is still one of the first and one of only a handful of doctoral programmes in emergency medicine on the continent. Despite its establishment, the progress of candidates through the programme is protracted and inconsistent, with some candidates taking three times longer to complete than others. A number of interventions are required to address this. It is anticipated that by transforming the curriculum to one that is responsive to candidate and stakeholder needs and by having clear competencies with intentional teaching-learning methodologies, some challenges may be mitigated. Additionally, shifting the focus away from a numerical output towards developing successful, research independent, thriving scholars, may assist in shifting the status quo and better contribute to African research-capacity building and output. This study aimed to understand the thoughts, experiences, and opinions of current and previous candidates of the PhD EM programme, in the Division of Emergency Medicine at the University of Cape Town, South Africa. To this end we sought to determine how best to address their past and current academic needs, to make them not only successful graduates, but also independent researchers.

## Research methods

### Study design

This interpretivist-constructivist study sought to understand the world as others experience it on the basis that reality is socially constructed. A descriptive, qualitative design used semi-structured interviews to gather data on the needs of past and current candidates registered on the PhD in Emergency Medicine programme. One-on-one interviews were selected as each candidates' individual perspective was sought. This data collection method was selected to accommodate personal or sensitive disclosures by PhD candidates. This study is reported in keeping with the COnsolidated Criteria for REporting Qualitative research checklist (COREQ) [12].

### Setting

To the best of our knowledge, the University of Cape Town's (UCT) Division of Emergency Medicine is the largest on the continent. The Division actively supports and advocates for the development of academic emergency care in Africa. The PhD programme currently has 17 registered South African candidates, 7 candidates from elsewhere in the

continent and 6 from outside the continent. This programme is one of the newest among several PhD programmes offered at UCT, one of the consistently top ranked universities on the continent [13].

At UCT, like at most South African universities, doctoral candidates are eligible for graduation upon completion of a substantial and novel doctoral thesis that is assessed by three external examiners. UCT is currently piloting PhD oral examinations for full implementation in 2024. At present, there is a proposal presentation that ideally occurs in the first year of registration. At minimum, candidates are required to be registered full-time for four semesters (two years) before being eligible for graduation. At the time of publication, the UCT PhD fees for one year was 24750 ZAR (approximately 1360 USD) for students in the Southern African Development Community (SADC). International PhD students are required to pay this with a 4700 ZAR (approximately 259 USD) non-refundable international service fee [14]. PhD EM candidates are almost always self-funded. In 2018, a compulsory 3-month pre-course was initiated, which aided potential PhD candidates in the development of their research summaries (concept note). The course, offered free of charge, is called the PhD EM Bootcamp. Apart from guiding potential candidates through the process of developing their problem statement, aim, objectives and methods, ad hoc lectures on research methods are also given. Potential PhD candidates are only eligible for selection upon successful completion of the Bootcamp.

### Study population and sampling strategy

The PhD EM programme has had approximately 13 graduates since 2017 and at the time of publication has 30 candidates registered on the programme. Approximately 8 candidates have deregistered from this programme since 2017. All past and current candidates were eligible to participate in the study and no exclusion criteria was applied.

All past (including deregistered) and current candidates were approached in order to voluntarily partake in the study. An initial target of 6-8 participants was sought. Sampling continued until saturation occurred. In this instance, data saturation was defined as informational redundancy, the point where no new data emerges at a subsequent interview [15].

### Recruitment of participants

Past and current PhD candidates were approached by email on the email addresses registered with the Division of Emergency Medicine. In order to avoid undue influence, the initial invitation to participate was sent to potential participants by an administrator in the Division. The email requested prospective participants to contact one of the investigators should they wish to participate. Current candidates were to approach a member of faculty (WK) who is not a member of the coordinating team on the PhD EM programme, graduates were asked to approach either of the investigators (WC, WK, WS).

### Author characteristics and credentials

WK identifies as female, while WC, WS, and SR identify as male.

WK is a specialist EM physician with a PGDip in Health Sciences Education (HSE), she is also an MPhil HSE candidate. WC is a PhD candidate in Forensic Medicine. WS and SR hold PhD degrees in EM and pharmaceutical sciences respectively.

WK is the convener of the MMed in EM programme at UCT. WC and WS are convenors of the PhD in EM programme at UCT. SR was previously a convener on the PhD EM programme, now employed at Stellenbosch University in the Department of Physiological Sciences. Both WC and WS have professional backgrounds in paramedicine.

### Data collection

Semi-structured interviews were conducted according to a discussion schedule. This original discussion schedule was informed and updated

through a literature review of doctoral education. For current candidates, the discussion schedule related to the candidates' motivation for doing the PhD, what their expectations of the programme are and what some of the strengths and opportunities for improvement of the programme are, it further aimed to understand their specific learning needs. For past candidates, the schedule related to the skills that they have learned, their motivation for doing the PhD as well as the strengths and limitations of the programme. The interviews were conducted between the 6<sup>th</sup>-10<sup>th</sup> December 2021 using Microsoft Teams (Microsoft Corporation; Redmond, Washington, U.S.). Written informed consent was obtained prior to beginning discussions; consent was also confirmed verbally at the time of the interview. In order to avoid bias or undue influence, participants who had already graduated from the PhD EM programme were interviewed by WC and WS. Participants who were currently registered as PhD candidates had interviews conducted by WK. The investigators had experience and specific training in the conduct of qualitative research (WC and WS) and medical education (WK). All interviews were conducted in English and audio recorded for transcription.

The verbatim transcripts of the interviews were completed by an independent transcription service, who signed a non-disclosure agreement. Audio files were permanently deleted after transcription. Transcripts were stored on a university-based cloud service (OneDrive, Microsoft Corporation; Redmond, Washington, U.S.) with access restricted to the investigators (WC, WS, WK). Field notes were taken during the interviews to assist the analytic process.

#### Data analysis

The anonymised transcriptions were analysed using inductive-dominant content analysis to the manifest level using NVivo Pro (v. 12; QSR International, Burlington, Massachusetts, U.S.). The data analysis was completed using a five-step approach: 1) immersion in the data, 2) extraction of meaning units, 3) condensing or summarising larger meaning units, 4) allocating codes to meaning units, 5) organising codes into categories. As new codes were developed from the data, these were applied deductively to all the transcripts. Data analysis was performed separately by WS (graduates) and WC (current candidates). Codes were compared to ensure theoretical triangulation between the investigators. A third investigator (WK) reviewed the analysed data independently.

#### Trustworthiness

In keeping with Guba's constructs, qualitative rigour is facilitated through trustworthiness of the research process and data by addressing credibility, dependability, transferability and confirmability [16].

*Credibility* deals with how congruent the findings are with reality. This is ensured by using well-established methods to collect qualitative data [17]. As participation in this study is completely voluntary, it can be assumed that only participants that are willing to give data freely will be enrolled, thus ensuring honesty by participants [18]. During interviews, methods of iterative questioning were employed. After interviews, debriefing sessions were held with the study team (WC, WK, SR, WS) in order to provide a sounding board for developing ideas and assumptions. These sessions also provided a basis for reflective commentary, which in itself adds to the credibility of the study [18]. Finally, member checking after transcription and coding was completed.

*Dependability* deals with the repeatability of the results [17]. This was ensured through the detailed description of the methods that were employed for qualitative data collection and analysis [18]. Dependability was further ensured through the reflective commentary related to prior assumptions and regular debriefing [18].

*Transferability* relates to the generalisability of the findings obtained [16]. This study aimed to obtain the views of specific people, environments, and their constructed realities. For this reason, transferability

cannot be guaranteed, nor should it be dismissed. The detailed description of the setting and the sampled population will allow for each reader to make a judgement related to the transferability of the findings [18].

*Confirmability* refers to the objective and unbiased analysis, interpretation and presentation of the findings [16]. Regular debriefings and reflective commentary bolstered confirmability [18]. Interviews of this nature may be associated with a high face validity as the participants are required to understand the questioning in order to answer appropriately. The use of a reporting checklist, Consolidated criteria for Reporting Qualitative (COREQ) research was employed to ensure transparency. This further supports the dependability of the study [19].

#### Ethical considerations

Ethical approval for this study was obtained from the Human Research Ethics Committee of the University of Cape Town (HREC REF: 287/2021). Further approval for doing research on UCT candidates was obtained from the Department of Student Affairs, University of Cape Town.

#### Findings

Eight current and past PhD EM candidates responded to the invitation, and all were interviewed. Four were current candidates, and four were graduates. None of the deregistered past candidates elected to partake in the study. Five participants self-identified as male and three as female. Five participants were from Africa and three were from high-income countries (HICs). The backgrounds of the participants were as follows; three paramedics/prehospital, three emergency physicians, and two public health. The interviews lasted between 31 minutes and 1 hour, with an average of 45 minutes.

Four key categories were developed from these interviews: 1) interviewees had various motivations for starting a PhD in EM, 2) candidate expectations and learning needs were not always aligned with reality, and the challenges and opportunities for success in the PhD programme are related 3) intrinsically (candidate) and 4) extrinsically (system). Data saturation was reached, and the authors decided that further interviews would not have yielded new or unique findings. Table 1 displays an extract of a coding tree which describes how meaning units were abstracted into categories. All participants received a copy of the study findings and were given an opportunity to provide feedback. No changes were suggested from the participants.

#### Motivations for starting a PhD in EM

##### To make a change

Some participants felt that by completing their PhD studies they would be in a position to affect change in their settings. This is something which they believe they will not be empowered to do without the knowledge and technical skills learnt in the doctorate process.

*"...the main reason... was mainly to, to equip myself with the skills and the knowledge that I will need in terms of research and setting up systems and education in emergency care in countries where emergency medicine simply do not exist..." – Cand 4*

##### To earn a voice

Participants felt that having the title of "doctor" elevated them in a social and professional standing to allow them to be heard by senior members, when they would have been ignored otherwise.

*"I was fortunate to speak to a bunch of CEOs of ambulance services and medical directors, and I tell you now if I didn't have that in my title, they wouldn't have even thought to speak to me." – Grad 1*

**Table 1**  
Coding Tree Extract

Meaning unit	Condensed meaning unit	Code	Sub-category	Category
"...in the back of your head it's always a case of me proving to myself that I can do this and that no one will ever hold me back" – Cand 2	"...me proving to myself...I can do this...no one will ever hold me back"	Proving it to themselves	Personal Achievement	Motivations for starting a PhD in EM
"I was fortunate to speak to a bunch of CEOs of ambulance services and medical directors, and I tell you now, if I didn't have that in my title, they wouldn't have even thought to speak to me." – Grad 1	"...speak to...CEOs...medical directors...if I didn't have that title, they wouldn't have even thought to speak to me"	"Dr/PhD" title made people listen	To earn a voice	
"It felt very loosely structured initially... no structured learning, you just need to do a research project..." – Grad 1	"...very loosely structured initially... no structured learning... just need to do a research project..."	No real programmatic structure	Expectations of structure	Expectations and learning needs
"...but at a later stage having them [PhD student] mentor or supervise closely like say a master's or an honour student will be extremely beneficial" – Grad 2	"...having them [PhD student] mentor or supervise...a master's or an honour student...extremely beneficial"	Benefit of planned supervision	Supervision as an outcome	
"...working from Johannesburg I don't have, I can't just walk into the university and say hey, I need help" – Cand 2	"...from Johannesburg...I can't just walk into the university and say...I need help"	Remote learning reduces access to support	Remote learning hampers a sense of community	Candidate related challenges and opportunities for PhD EM success
"I've had someone who I can turn to, but what about that person sitting by themselves in some country off the beaten track?" – Cand 2	"I've had someone who I can turn to...what about that person sitting by themselves in some country off the beaten track?"			
"I think there's a lot of personal issues that people underestimate the amount of time and work it's going to take of you. Sometimes life just happens, some people fall pregnant or somebody passes away" – Grad 4	"...there's a lot of personal issues that people underestimate the amount of time and work...Sometimes life just happens...some people fall pregnant or somebody passes away"	Unexpected personal events which hamper progress	Personal candidate challenges	

### Personal achievement

Many participants had a yearning for completion in their academic career, and that the PhD was the ultimate sign of accomplishment. Many participants had a personal drive to prove to themselves that it was something they could achieve.

*"I wouldn't be satisfied with just a Master's level..." – Cand 1*  
*"...in the back of your head it's always a case of me proving to myself that I can do this and that no one will ever hold me back" – Cand 2*

While some participants responded that the PhD was a learning experience, another participant explained that the PhD should rather be for experienced researchers who are looking to validate their achievements through the doctorate. This is a view which sees the PhD qualification as the end point and not the journey in academia, the PhD rather validates accomplishment.

*"I would be very concerned if somebody has one publication to their name and then joined a PhD programme. I think that's missing the reason for doing a PhD... people should be involved in a couple of research projects, published a couple of things as primary author...know the difficulties that they're going to encounter, and then the PhD is just the cherry on top." – Grad 4*

In an opposing view, a participant explained that because the number of PhD graduates are increasing (individuals with prehospital backgrounds specifically), the worth of the qualification is actually eroding. He cautioned that the qualification is intended for people who wish to enter academia as a career.

*"I think the PhD should still be for those that are really pursuing a research career because to be honest, having a PhD as a paramedic and more and more paramedics in the world are now having PhDs, ... it doesn't really mean that much anymore." – Grad 1*

### Expectations and learning needs

#### Expectations of structure

When questioned about the presence or absence of structured coursework in the programme all the participants responded that they did not experience any meaningful structure.

*"It felt very loosely structured initially... no structured learning, you just need to do a research project..." – Grad 1*  
*"For the curriculum... consider maybe making it more structured... I think that would give us an opportunity to be more successful." – Cand 3*

#### Pre-doctoral training

When questioned about the use of preparatory courses as a prerequisite for the PhD, many participants spoke favourably about the recent implementation of a PhD EM Bootcamp.

*"...the bootcamp this year was probably the greatest preparation for this PhD programme so far" – Cand 2*

#### Independence as an outcome

The concept of research independence was found to be a desired outcome, particularly for graduates. There is a potential need for directly strengthening the independence of candidates during their studies.

*"...like if you're graduating UCT doctoral students, you don't want their very first taste of independence and self-responsibility to be after graduation." – Grad 2*

### Supervision as an outcome

Also, as an outcome, participants valued the opportunity to supervise master's students during their PhD studies. There is a potential need for directly strengthening the supervision capabilities of candidates during their studies.

*"...I don't think I'm an excellent supervisor, but I do think that after finishing my PhD I had like a lot more skills to pass onto people" – Grad 3*

### Networking as an outcome

As a final outcome, graduates found that networking assisted them in finding work and research collaboration opportunities. There may be a need to actively inform candidates about the importance of networking during their studies.

*"...networking as well, initially people don't really know who you are, but the more you publish and you get out there, the more people are willing to speak to you." – Grad 1*

### Candidate related challenges and opportunities to PhD EM success

#### Remote learning hampers a sense of community

While working remotely is not a new concept and it has been thrust into popular practice by the COVID-19 pandemic, many participants who reside outside of the city or country they study in, find it challenging. These candidates do not feel a real sense of community (between each other, their supervisors, and the university as a whole).

*"I like human contact. I like to be able to sit with you and have a cup of coffee and say this is why I'm battling" – Cand 2*

*"When I have these long distance [interactions]... then I don't form relationships, I don't" – Cand 3*

#### Prior education left large knowledge gaps

Both candidates and graduates had a perception that they were not adequately prepared for their PhD in terms of research methodology, publishing, or experience.

*"...even simple biostatistics, I had no idea how it works. And I had to teach myself." – Grad 1*

*"I was not a very strong researcher to begin with... and so it was all new to me." – Cand 3*

#### Personal candidate challenges

All participants explained that personal challenges were often restraining factors in them achieving their research and qualification goals in a set timeframe.

*"I think there's a lot of personal issues that people underestimate the amount of time and work it's going to take of you. Sometimes life just happens, some people fall pregnant, or somebody passes away." – Grad 4*

#### Peer-based learning

The majority of participants found that the support they received and were able to reciprocate to each other is extremely helpful while other participants explained that peer-based learning only works for specific types of individuals. A lot of the experiences of peer-based learning stemmed from the implementation of the PhD EM Bootcamp.

*"...it was nice to hear other peoples' ideas and then just discuss amongst the small groups, and even in my own mind as to how would I put that together, what are some other peoples' ideas. I think that's beneficial, so if that were to be included more, I would find that helpful" – Cand 1*

### System related challenges and opportunities for PhD EM success

#### Admin and institutional restraints

Participants often felt that they were unsure of the university processes and the responsibilities of each unit (divisional research committee, human research ethics committee, doctoral degrees board).

*"...when I came in, I think I was very confused on the structure of how the graduate programme worked and who answered to who..." – Grad 2*

#### Clinical work takes priority over research

The graduate participants, specifically, found that clinical professions tend to keep research as a second priority even after completing their PhDs.

*"I'm going to focus on paramedics here, but even emergency physicians, once they have finished their PhD's, their clinical work is still very important, and they might dabble in some research on the side." – Grad 1*

#### Supervision challenges

All participants explained that while their PhD supervisors were highly proficient in their function, they were also extremely busy. Some participants experienced difficulty in finding a suitable supervisor in their home country.

*"Look, they do very well with the workload, but sometimes if your supervisor is having 15 plus projects, I think it's probably a little bit much." – Cand 1*

#### Afro-centric approaches to research

The participants identified the potential value in having a variety of academics work in the division as joint or permanent staff. Actively recruiting individuals with mixed geographic and professional backgrounds could help foster the culture of transformation sought by the university, while also exposing candidates to different fields of research.

*"... if we have staff that are also from Kenya or from Sudan somewhere or from Senegal, among the whole of the division, which is our African base, that will make the university be more African and more global" – Cand 4*

### Discussion

The aim of this study was to understand the thoughts, experiences, and opinions of current and previous candidates of the PhD EM programme, in the Division of Emergency Medicine at the University of Cape Town, South Africa. We found that participants had a myriad of internal and external motivators to pursue a PhD in EM. Unfortunately, the current course offerings are misaligned to the candidates' learning needs and expectations. Limitations as well as opportunities for successful progression in the PhD course are both candidate and system (health/education) related. The views and experiences of this study's participants closely align to the findings from other sources in Africa [20–24].

Wellington in his article titled "Searching for 'doctorateness'" collated intrinsic and extrinsic aspects as well as insider and outsider perspectives to answer the question "What is the purpose of the doctorate?". Our findings, relating to participant motivations for starting a PhD in EM, link strongly with Wellington's conclusions. Some may pursue a PhD to prepare them for a future role or career, career development for those who are already working. It can be seen as a mechanism to develop and refine certain generic skills which can be transferable to

other contexts such as “problem-solving, researching, writing and communicating” (25 p1492). It could be to satisfy the personal development and sense of achievement of the candidate. And finally, the doctorate can be seen in terms of the output or contribution [25]. Wellington acknowledged the difficulty in describing the concept of ‘doctorateness’. He concluded with his own sentiment that the concept of “contribution” in the field of study is the most necessary attribute of the PhD, not however in isolation [25]. There appears to be a conceptual alignment between the motivations of the participants in pursuing a PhD and what Wellington describes as *doctorateness*. Participants spoke directly to “earning a voice” and “making a change” in their respective settings. Others described the simple need to challenge themselves, seeking to fulfil specific intrinsic outcomes. The question however arises; “Does the programme align with these concepts and outcomes?” The answer is probably “No, not in its current form”. At the very least, candidates likely attain these attributes by accident and not by design. The authors agree with Wellington that, especially in the nascent field of Emergency Medicine in Africa, the concept of contributory research should be seen as the principal, but not the only, characteristic of quality graduate work.

Producing work that is contributory to the field of study, can be a demanding undertaking, especially if individuals are not suitably capacitated to conduct simple research-related tasks [26]. The participants in this study and the findings from other sources, describe the lack of baseline research literacy when starting their doctoral journey. This is a known contributor to protracted PhD completion times, heightened candidate anxiety and the limited research production within the continent [20,21,26,27]. Pre-doctoral training is a potential mitigating step for this barrier, in part, by providing research guidance and support for prospective candidates. If one were to ask the question, “Should the PhD programme be ‘picking up the slack’ or should the candidate enter the programme suitably prepared?”, one could respond that for the programme to be truly transformative and address research inequality, the needs of African EM, and the goals of UHC, then scaffolding these perceived competency gaps is a programmatic imperative. This undertaking will certainly be resource intensive, yet crucial to plan and accommodate for within the programme curriculum. In addition, more EM doctoral programmes contributing to the discourse need to be established in order to support the academic project of promoting an African evidence base that originates from Africa.

Similarly, the participants expressed their desire to exit the programme with broad knowledge and skills in supervision, networking, and research independence, in addition to their area of expertise. Researcher independence here differs to independent learning skills, as this is a prerequisite for doctoral education. Researcher independence can be described as having both the independence *from* factors such as supervisor and organisational influence and having the independence *to* create and fulfil one’s own research agenda [28]. This may be natured through guided learning on research philosophy and methods.

The majority of participants desired structured course work which aligned to key competencies and this may be a logical solution for a few barriers to EM research capacity within the continent [29]. “Structured” in this sense may relate to individualised study plans for each PhD candidate. Through a collaborative process between the candidate, supervisor[s] and programme convenors, a tailored study plan with set learning outcomes can be developed. Such a competency-based PhD programme may help candidates achieve *their* purpose in pursuing the PhD qualification. This could also help candidates gauge whether they are ready, willing, and able to register for the PhD from the outset. Actively engaging candidates with topics such as authorship, academic writing, project management, research methods and supervision can aid in the transferability of doctorate skills while simultaneously providing a pathway for career progression, knowledge generation and candidate personal achievement [29].

If doctoral programmes are to migrate from a model where all teaching and learning is channelled through the supervisor to one with ele-

ments of structured coursework, considerations need to be made when deciding the level of desired candidate engagement. The use of email, video conferencing and voice-over-internet protocol (VOIP) has led to numerous opportunities for distance learning and supervision, especially in circumstances when travelling to the place of study is impossible or infeasible [22,27]. Distance learning however, even if feasible, still has considerable drawbacks for some. The lack of socialisation associated with distance learning/supervision can be disheartening at the least or a factor for doctoral candidate attrition at its worst [24,30]. PhD candidates studying from distant settings may long for the collaboration and networking opportunities often available to those who study in their home city or country. This feeling may be exacerbated as their chosen field of EM may be established in their academic country but not in the one they reside. While regular online meetings can satisfy some candidates, others feel that it does not suffice.

African PhD candidates who are also clinicians face bi-lateral challenges. They will experience the stresses of a typical PhD candidate as well as the immense demands of a strained healthcare system. Academic protected time for clinician PhD candidates would help to ease some of the burden, but this is often impossible in many understaffed hospitals within the continent. In addition, the EM PhDs are usually unfunded, so candidates are expected to “pay their own way” through their academic career. These sacrifices may come with little reward as the promotion criteria in clinical placements would often see the PhD as an over-qualification. This is due to the progression criteria for clinicians being misaligned to that of academics. The graduate participants explained that even if clinicians do complete their PhD studies, they often revert to performing clinical work while supervising or producing research peripherally. This finding may rather be a symptom of a health systems constraint. Nakanjako et al. claimed that it was the lack of sufficient human resources in the clinical environment that resulted in clinicians being pulled into non-research tasks [21]. The above factors may certainly lead to a lack of motivation for clinicians to conduct research. Potential solutions for this include advocating for promotion criteria which value contributions to the EM discourse, as well as financial incentives and joint positions between universities and clinical institutions [21,31,32].

One of the main challenges reported by participants was that their university-assigned supervisors were over-subscribed. While the quality of supervisor was not brought into question, the quality of the relationship between candidate and supervisor was perceived to be unsatisfactory. PhD supervisors often oversee multiple students from different programmes and are often actively involved in managing large classes of undergraduate and postgraduate students. This limited time for individual supervision is a barrier to candidates who value face-to-face or more personal support [20,33,34]. Limited supervision capacity of suitable academics can be seen as both a cause and a symptom of the nascency of EM in Africa - there are just not enough qualified academics in the field who are endorsed as having expertise in skills of supervision to cater for the current and expected number of registered candidates. Suggesting that PhD candidate intake should be curtailed due to a shortage of trained and experienced supervisors may further perpetuate the shortages of African EM academics, thus sustaining the status quo. Novel solutions should be sought. Perhaps this may be addressed through peer-based learning, mentorship, and support.

Peer-based learning, mentorship, and support was found to be a lifeline for some participants while being a hinderance to others. The benefits of this planned approach are that candidates can have the autonomy to direct their own learning. If online learning platforms are used meaningfully, peer-to-peer learning can be a solution to catalyse collaborative learning activities [22]. Not as a replacement to the student-supervisor relationship, these candidate networks can help to *augment* the support structures available in doctoral studies. Peer mentorship and support has been found to be effective in doctoral education when candidates have an opportunity to present their research to one another, or when they have access to collaborative learning activities using discussion forums

or other text-based platforms [21,35]. This form of collaboration can however lead to increased anxiety and self-doubt as some candidates may perceive their progress to be slower than that of their colleagues.

The experiences of participants feeling that they were ill prepared for the PhD is not an isolated finding and it may be rather intuitive that candidates would find difficulty in certain aspects of their doctoral journey. Smit et al, mentioned the ailing quality of incoming students and blockages in the graduate and postgraduate pipeline as two of the constraints to the productivity of PhD programmes in SA Higher Educational Institutes [24]. While the findings were related to SA institutions, they are transferable. Wholly underprepared candidates who find difficulty in writing in the language required for their PhD, or who have never been exposed to biostatistics may find greater challenges in completing their studies in a reasonable time than others [20]. While the concept of “PhD-readiness” is ill defined, a potential solution is to address problems as they arise. This can be achieved with intensive guidance during the process of conducting the research and writing the dissertation on a case-by-case basis with the specific needs of the under-prepared candidates being identified and addressed [30].

Candidate anxiety is a common finding in any academic programme. However, the age of the candidate at time of enrolment, and specific professional and family commitments are exacerbating factors of heightened anxiety in PhD studies [24,27]. Some findings suggest that the financial factors associated with recurring registration fees, and research-related costs can have subsequent effects in the personal lives of candidates [24]. A well curated PhD journey may help to minimise some of the stresses experienced by candidates. Structuring of the PhD programme in terms of theoretical and practical teaching-learning opportunities with guided completion times may facilitate the progression of candidates through the doctorate with the goal of reducing time to graduation and improving candidate actual and perceived competencies in research skills, supervision, project management, and leadership [24].

Furthermore, universities often have multiple specific administration units (applications, and committees for post-graduate studies, divisional and departmental research approval, human research ethics etc) as well as several online applications related to registration, funding, and learner management systems. The issue arises when communication falters between the units. Avoidable delays caused by the oversight of an individual (whether divisional or university) can lengthen an already prolonged study period [20,21]. New candidates who are not orientated to the various processes will not be able to navigate efficiently through the system. It is essential that *both* the candidate and the supervisors are appropriately orientated to the role and function of the relevant administration units.

The participants spoke to the value of having experts from other fields and backgrounds supervise, co-supervise or lecture within the academic department. The benefits of having this multidisciplinary approach extends beyond improved supervision capacity brought by other, more developed disciplines. Complex problems can only be solved if we view them from a multitude of different lenses and professions. Apart from having external supervisors, the prescribed international exposure of doctoral candidates is a proposed intervention to widen the knowledge base of candidates [23,36,37]. This international exposure could serve to promote networking within their discipline for future collaboration or employment and improve the research confidence of candidates. It further expands the community of practice and can contribute to developing global scholars. The overall goal would be to produce a PhD graduate who can function as an independent researcher, is skilled in supervision and research project management, and is responsive to the needs of the African people by contributing impactfully to the discourse.

We received no responses from candidates who deregistered from the programme without completing their PhD. The authors are aware of the risk of self-selection and confirmation bias. We attempted to overcome this risk by ensuring that the questions posed to the participants were

not leading. Furthermore, PhD candidates who were currently enrolled on the programme were interviewed by WK, who is not a member of the coordinating team for the PhD programme. Data analysis was completed by WC and WS, and meetings were held with WK to ensure congruency of the analysed data to the anonymised transcripts. As this study is descriptive and qualitative, transferability is difficult to ascertain.

## Conclusion

There are multiple barriers faced by African PhD EM candidates. Many of these barriers can be related to not only the nascency of the speciality within Africa, but also African doctoral programmes more broadly. There are, however, numerous opportunities for improvement. The participants are faced with complex university administrative processes which they are not adequately orientated to. They described their experiences of being underprepared for the doctoral programme in terms of their baseline research literacy and skill. Candidates, local and from abroad, are not receiving the student-supervisor engagement they desire and candidates who are also clinicians face compounding pressures as a result of overburdened and resource-limited healthcare systems. All of the above may result in protracted registration periods (with repeated tuition payments), heightened candidate anxiety and drop-outs.

A well curated competency-based PhD programme design with clear outcomes, structured teaching-learning opportunities, and one that is intentional about strong academic support throughout the programme, can mitigate the above. Pre-doctoral training can be a useful tool to upskill prospective candidates in research literacy and methodology before registering as a doctoral candidate. Distance learning, while empowering to some, can lead to sub-optimal experiences for others, especially those who yearn for social interaction and collaboration. Structured learning utilising sound teaching-learning methodologies may assist by formalising these interactions. In an emerging speciality, clinician researchers are essential to drive innovation and reach critical mass. Shared advocacy for clinician candidates who are service delivery oriented is also required. Protected academic time, promotion criteria which acknowledges contributions to the field of study, financial incentives and more joint positions between universities and clinical services are all potential solutions to the barriers faced by these clinicians. PhD programmes should also be open to the notion of external, multidisciplinary approaches to programme support and supervision. While this can assist with the human capital capacity restraints of PhD programmes, multidisciplinary interventions can also expose candidates to applied knowledge generation which is essential for health system strengthening. The goal of the PhD EM programme should be to produce PhD graduates who are independent researchers who may then become skilled supervisors themselves. These graduates should be largely responsive and impactful to African needs by contributing to the African EM knowledge economy.

## Dissemination of results

Study findings were shared with participants through an informal presentation. The findings will also be shared through a formal presentation at the University of Cape Town.

## Authors contributions

The authors contributed as follows to the conception or design of the work; the acquisition, analysis, or interpretation of data for the work; and drafting the work or revising it critically for important intellectual content: WC contributed 50%; WS 30%, WK 15%, SR 5%. All authors approved the version to be published and agreed to be accountable for all aspects of the work.

## Declaration of Competing Interest

Dr Willem Stassen is an editor of the African Journal of Emergency Medicine. Dr Stassen was not involved in the editorial workflow for this manuscript. The African Journal of Emergency Medicine applies a double blinded process for all manuscript peer reviews. The authors declared no further conflicts of interest.

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## References

- [1] Thind A, Hsia R, Mabweijano J, Hicks ER, Zakariah A, Mock CN. Prehospital and emergency care. *Essential surgery: disease control priorities, third edition (volume 1)*. Washington (DC): the international bank for reconstruction and development. Debas HT, Donkor P, Gawande A, Jamison DT, Kruk ME, Mock CN, editors. /The World Bank © 2015 International Bank for Reconstruction and Development /The World Bank; 2015.
- [2] van Hoving DJ, Brysiewicz P. African emergency care providers' attitudes and practices towards research. *Afr J Emerg Med* 2017;7(1):9–14.
- [3] Volmink J, Dare L. Addressing inequalities in research capacity in Africa. *BMJ* 2005;331(7519):705–6.
- [4] Van Olmen J, Criel B, Bhojani U, Marchal B, Van Belle S, Chenge FM, et al. The health system dynamics framework: the introduction of an analytical model for health system analysis and its application to two case-studies. *Health, Cult Soc* 2012;2.
- [5] Kruk ME, Freedman LP. Assessing health system performance in developing countries: a review of the literature. *Health Policy* 2008;85(3):263–76.
- [6] Confait MF. Maximising the contributions of PHD graduates to national development: the case of the Seychelles. Edith Cowan University; 2018.
- [7] Casey BH. The economic contribution of PhDs. *J Higher Edu Policy Manage* 2009;31(3):219–27.
- [8] Becker GS. Investment in human capital: a theoretical analysis. *J Polit Econ* 1962;70(5):9–49.
- [9] Becker GS. Human capital: a theoretical and empirical analysis, with special reference to education. 3rd ed. Chicago: University of Chicago Press.; 1993.
- [10] Baker V, Lattuca L. Developmental networks and learning: toward an interdisciplinary perspective on identity development during doctoral study. *Stud High Educ* 2010;35:807–27.
- [11] Walker GE, Golde CM, Jones L, Bueschel AC, Hutchings P. The formation of scholars: rethinking doctoral education for the twenty-first century. San Francisco, CA: Jossey-Bass; 2008.
- [12] Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *Int J Qual Health Care* 2007;19(6):349–57.
- [13] Scimago Institutions Rankings. Institutions and University Rankings 2023 [Available from: <https://www.scimagoir.com/rankings.php?sector=Higher+educ.&country=Africa>].
- [14] University of Cape Town. Fees for students studying for a UCT qualification 2023 [Available from: <https://uct.ac.za/international/student-support/fees>].
- [15] Saunders B, Sim J, Kingstone T, Baker S, Waterfield J, Bartlam B, et al. Saturation in qualitative research: exploring its conceptualization and operationalization. *Qual Quant* 2018;52(4):1893–907.
- [16] Guba EG, Lincoln YS. *Fourth generation evaluation*. Sage; 1989.
- [17] Nowell LS, Norris JM, White DE, Moules NJ. Thematic analysis: striving to meet the trustworthiness criteria. *Int J Qual Methods* 2017;16(1):1609406917733847.
- [18] Shenton A. Strategies for ensuring trustworthiness in qualitative research projects. *Edu Info* 2004;22:63–75.
- [19] Booth A, Hannes K, Harden A, Noyes J, Harris J, Tong A. COREQ (consolidated criteria for reporting qualitative studies). *Guidelines for Reporting Health Research: A User's Manual*; 2014. p. 214–26.
- [20] Igumbor JO, Bosire EN, Karimi F, Katahoire A, Allison J, Muula AS, et al. Effective supervision of doctoral students in public and population health in Africa: CARTA supervisors' experiences, challenges and perceived opportunities. *Global Public Health* 2022;17(4):496–511.
- [21] Nakanjako D, Katamba A, Kaye DK, Okello E, Kanya MR, Sewankambo N, et al. Doctoral training in Uganda: evaluation of mentoring best practices at Makerere university college of health sciences. *BMC Med Edu* 2014;14(1):9.
- [22] Protsiv M, Rosales-Klitz S, Bwanga F, Zwarenstein M, Atkins S. Blended learning across universities in a South-North-South collaboration: a case study. *Health Res Policy Syst* 2016;14(1):67.
- [23] Sheehan A, Comiskey C, Williamson C, Mgtshini T. Evaluation of the implementation of a PhD capacity-building program for nurses in South Africa. *Nurs Res* 2015;64(1):13–23.
- [24] Smit B, Williamson C, Padayachee A. PhD capacity-building, from aid to innovation: the SANPAD-SANTRUST experience. *Stud Higher Edu* 2013;38(3):441–55.
- [25] Wellington J. Searching for 'doctorateness'. *Stud Higher Edu* 2013;38(10):1490–503.
- [26] Fetene G, Wondwosen T. The PhD journey at Addis ababa University: study delays, causes and coping mechanisms. *Int J Doc Stud* 2021;16:319–37.
- [27] Okewole H, Merritt C, Mangezi W, Mutiso V, Jack HE, Eley TC, et al. Building career development skills for researchers: a qualitative study across four African countries. *Ann Glob Health* 2020;86(1):40.
- [28] Möller T, Van den Besselaar P, Mom C. What is researcher independence and how can it be measured? 2022.
- [29] Verderame MF, Freedman VH, Kozlowski LM, McCormack WT. Competency-based assessment for the training of PhD students and early-career scientists. *eLife* 2018;7:e34801.
- [30] Manyike TV. Postgraduate supervision at an open distance e-learning institution in South Africa. *South African J Educ* 2017;37(2):1–11.
- [31] Wenke R, Mickan S. The role and impact of research positions within health care settings in allied health: a systematic review. *BMC Health Serv Res* 2016;16(a):355.
- [32] DeBoer S, Dockx J, Lam C, Shah S, Young G, Quesnel M, et al. Building successful and sustainable academic health science partnerships: exploring perspectives of hospital leaders. *Can Med Educ J* 2019;10(1):e56–67.
- [33] Gasa V, Gumbo M. Supervisory support for Ethiopian doctoral students enrolled in an open and distance learning institution. *Int Doc Stud* 2021;16:047–69.
- [34] Cross M, Backhouse J. Evaluating doctoral programmes in Africa: context and practices. *Higher Education Policy* 2014;27(2):155–74.
- [35] Manabe YC, Nambooze H, Okello ES, Kanya MR, Katabira ET, Ssinabulya I, et al. Group mentorship model to enhance the efficiency and productivity of PHD research training in Sub-Saharan Africa. *Ann. Global Health* 2018;84(1):170.
- [36] Fonn S, Egesah O, Cole D, Griffiths F, Manderson L, Kabiru C, et al. Building the capacity to solve complex health challenges in sub-Saharan Africa: CARTA's multidisciplinary PhD training. *Can J Public Health* 2016;107(4-5):e381–e3e6.
- [37] Lalloo UG, Bobat RA, Pillay S, Wassenaar D. A strategy for developing future academic leaders for South Africa in a resource-constrained environment. *Acad Med* 2014;89(8):S55–9 Suppl.