



ORIGINAL ARTICLE

A description of the self-perceived educational needs of emergency nurses in Durban, KwaZulu-Natal, South Africa



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ABSTRACT

Introduction: Emergency nurses are usually the first to interact with critically ill patients and victims of violence and injuries, and require advanced skills and knowledge to manage such patients. Inadequate training prevents nurses from providing optimal emergency care, and it is important to investigate if there are any skills and competencies lacking in these emergency nurses. We sought to describe the self-perceived educational needs of emergency nurses in Durban, South Africa.

Methods: A descriptive quantitative survey was conducted with nurses working in four emergency centres (two state, and two privately funded hospitals) in Durban, South Africa.

Results: The survey questionnaire was distributed with a response rate of 79% ($n = 128$). Almost half the respondents (48%, $n = 61$) scored less than the mean score of 29, thus indicating lower competency levels. The majority of respondents (67%, $n = 85$) perceived themselves as highly competent in basic skills (e.g. assess breathing, administer oxygen, assess circulation). Less than half the respondents (45%, $n = 57$) perceived themselves as highly competent in the intermediate skills (e.g. control haemorrhage, assist with endotracheal intubation, manage shock). A large number of respondents (46%, $n = 59$) perceived themselves as least competent in advanced skills (e.g. defibrillation/cardioversion, interpreting an echocardiogram [ECG]). The mean score obtained for educational need was 100, thus reflecting a high educational need, and more than half the respondents (62%, $n = 79$) scored higher than the mean score of 100 for educational needs. The lowest score was 41. Thirty percent ($n = 38$) of the respondents scored 117, indicating educational needs for all the competencies listed. Overall, 72% ($n = 92$) agreed that emergency education was a need.

Discussion: The study emphasises the need for support systems for educational development of emergency nurses. Further training in specific skills and competencies may enhance emergency care provided. There is a growing need for ongoing educational development of emergency nurses in South Africa.

African Relevance

- Emergency nurses are usually the first to interact with critically ill or injured patients.
- Emergency nurses require advanced skills and extensive clinical knowledge to be able to manage these patients.
- There is a great need for ongoing educational development of emergency nurses in South Africa.

Introduction

South African emergency centres (ECs) are overwhelmed with patients 24 hours a day. Pressure on their services is intensified by high acuity levels in patient conditions that range from polytrauma to

multiple medical diagnoses. South Africa's quadruple burden of disease includes non-communicable diseases (33%), HIV/AIDS and tuberculosis (TB) (25.5%), injuries/violence (11.5%), and maternal and neonatal mortality (21.7%) [1,2]. Trauma is one of the leading causes of unnatural death and disability in South Africa (SA), with increasing costs that affect the economically active societies [3]. In SA, 28 per 10,000 people perish as a result of road fatalities, with 40 persons dying each day [4].

Emergency nurses are at the forefront of hospital service provision and are often the first to interact with and care for ill and injured patients; their role in ensuring high quality of emergency care is thus of crucial importance [5]. For this, they need to have had adequate training in appropriate competencies and skills [6]. They must apply clinical judgement to continuously and dynamically changing

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circumstances in response to patients' conditions, while prioritising care, coping with staffing shortages, and keeping abreast with technological advancements and ongoing acquisition of emergency skills and competencies. The theoretical and clinical competence emergency nurses are to complete is defined as three stages of learning, namely basic, intermediate and advanced [7,8]. Basic skills and competencies are the essential knowledge an emergency nurse should possess to facilitate optimal level of functioning, such as assessing breathing and circulation, as well as performing cardiopulmonary resuscitation (CPR). Intermediate skills are acquired with experience and increased knowledge, and these include assisting with endotracheal intubation or applying a pelvic wrap. Advanced skills involve the use of knowledge and critical thinking acquired through experience and post-basic training. These include skills such as interpreting arrhythmias and administering thrombolytics [7,8]. In addition to basic, intermediate and advanced skills, they are required to be sensitive and supportive towards the educational needs of patients and their families, covering wellness advice and prevention of injury and illness [9]. Emergency nursing practice requires a combination of theoretical knowledge, past experiences and cognitive domains for accurate and swift decision-making and prioritisation of care. Working in ECs also requires expertise in technology and equipment, awareness of social challenges, and the ability to work with prehospital healthcare providers, as well as expert knowledge in relation to all age groups and all medical and surgical specialities [10,11].

Emergency nursing in the developed world is one of the fastest growing specialities, with the role of advanced practice nurses (APNs) taking on increasing importance worldwide in various healthcare settings, including ECs. The criterion for APNs in the United States is completion of accredited graduate level programmes and maintaining competence as evidenced by recertification [12]. In the United Kingdom, nurses working in emergency centres prescribe and dispense medications using medical treatment protocols centred on evidence-based practice [13]. In a study by Romanzini and Bock [14], supervised training for trauma and pre-hospital care for emergency nurses was found to be lacking in educational programmes even at basic levels, contributing to negative experiences in emergency centres. An Australian study showed the need for scenario-based, context-specific emergency nursing education [15].

Emergency nursing in South Africa, as in the rest of the continent, is still in its infancy [16], however, there has been progress in developing it as a speciality with the establishment of the Emergency Nurses Society of South Africa (ENSSA) and the African Federation for Emergency Medicine (AFEM) Nurses Group. ENSSA serves to promote the advancement of emergency nursing through leadership, collaboration, education, practice development and research [17]. The society is currently leading the way in defining the scope of practice and the core skills for emergency nurses, and, in conjunction with the AFEM Nurses Group, has developed an African Emergency Nursing Curriculum (AENC). Prior to this, there was no consensus on a standardised approach to emergency nursing in South Africa [6].

Emergency nurses require advanced skills and extensive clinical knowledge to be able to manage a wide spectrum of emergency conditions; in Africa, however, such nurses currently face significant challenges [6]. There is limited literature pertaining to South Africa that describes skills and educational needs of emergency nurses. This study aimed to describe the self-perceived educational needs of emergency nurses in Durban, KwaZulu-Natal (KZN), South Africa.

Methods

A quantitative descriptive survey was used to describe the self-perceived competency levels and educational needs of emergency nurses in Durban, South Africa.

The setting of the study included the ECs of two privately funded and two state hospitals in Durban, South Africa. These hospitals were

randomly selected from a list of state and private hospitals with busy ECs (high acuity levels of patients) that provide 24-h emergency care for patients in the Durban area. Hospital A is an 846 bed, referral only public hospital, the second largest hospital in SA, providing tertiary services to KZN and Eastern Cape. Hospital B is a public hospital with 543 bed capacity. Hospital C is a private hospital with 204 beds. Hospital D is KZN's largest private trauma and EC with an adjacent helipad, and a bed capacity of 464.

The study population was all nurses in the ECs of the four hospitals who were enrolled or registered with the South African Nursing Council. Convenience sampling was used to include all nurses, on both day and night shift, who were available and willing to participate. The population size was 163 (100%), and the response rate was 128 (79%). This excluded staff on vacation or sick leave. Respective totals were 52 respondents for Hospital A, 27 respondents for Hospital B, 22 respondents for Hospital C, and 27 respondents for Hospital D.

The research instrument used was a structured, self-administered questionnaire developed by Rominski et al. [16], who also granted permission for its use. Modifications were made to the demographic data being collected to ensure relevance to the research setting. The demographic questions included gender, highest qualification, designation, day/night shift and length of work experience in the EC. A three-point Likert scale was used to rate current competencies from *least competent* to *highly competent*. Respondents could score between 15 (minimum) and 42 (maximum) for their level of competency. Educational needs were rated using a three-point Likert scale from strongly disagree to strongly agree. Respondents could score between 39 (minimum) and 117 (maximum). The higher the score, the greater the competence and needs.

The face and content validity of the survey instrument was previously assessed by emergency care experts in the United States (US) and Ghana [16]. A previous pilot study using US and South African nurses also indicated that the language and content of the questionnaire was appropriate for nurses who did not have English as a first language [16]. A pilot study was also conducted in the current study among emergency nurses in one of the selected hospitals and no modifications were made to the questionnaire. The results from the pilot study were not included in the data analysis.

Appointments were made with the nursing managers to access their nursing staff in the EC between 6 a.m. and 8 a.m. This was the most convenient time, with low patient numbers, giving staff (day and night shift) adequate time to complete the questionnaire. The research study was explained and permission gained to access the nurses each day over a period of four weeks (July 2015) to be able to access all shifts. Hard copies of the information sheet and questionnaire were handed to each nurse. Respondents completed the survey within 15–20 min and handed them back to the researcher (RD).

Using the Statistical Package for Social Sciences (SPSS), version 23, and the initial assistance of a statistician, descriptive analysis was carried out to provide information on the sample, such as age, gender, years of experience and designation. In the open-ended questions, the respondents were asked to list nursing procedures and equipment that they would like information on to facilitate their educational development. The frequencies of these responses were recorded. A nominal scale was used to document these findings. The second set of analyses addressed the research questions that guide this study, and ordinal scales were used to document these findings. The Chi-square test was used to determine the relationship between the public and private sector in relation to competency levels and educational needs (significance was set as $p < 0.05$).

Permission and approval to carry out the study was obtained from the University of KwaZulu-Natal Ethics Committee (HSS/0309/015M), the Department of Health, and the Research Operations Committee of each privately funded hospital. Participation was voluntary and written informed consent was obtained from each respondent prior to data collection. Respondents could withdraw from the study at any time.

Table 1
Demographic data.

Category of nurse	Public Sector	Private Sector	Years of experience in EC*			
			< 1 yr	> 1- < 2 yrs	> 2- < 5 yrs	> 5 yrs
Registered nurses	45	30	11	3	18	42
Enrolled nurses	34	19	16	7	17	11
Total (n)	79	49	27	10	35	53

Designation and hospital sector				
Hospital	Registered nurses (n)	Enrolled nurses (n)	Total (n)	%
A (public)	27	25	52	41
B (public)	18	9	27	21
C (private)	11	11	22	17
D (private)	19	8	27	21
Total (n)	75	53	128	100

*, Missing data.

Complete anonymity of the respondents was maintained and data could not be traced back to the individual or institution.

Results

Demographic characteristics

The response rate was 79% (n = 128). Table 1 and Table 2 illustrate the demographic data. The majority of the respondents held diplomas in nursing (56%, n = 7), while 41% (n = 53) had certificates, and 3% (n = 4) bachelor's degrees. Only two of the respondents had a post basic diploma in Trauma/Emergency Nursing and one respondent had a diploma in Nursing Administration.

Competency levels

Competency levels were self-rated for basic, intermediate and advanced skills (Table 2). Almost half the respondents (48%, n = 61) scored less than the mean score of 29, thus indicating lower competency levels. The majority of respondents (67%, n = 85) perceived themselves as highly competent in basic skills (e.g. assess breathing, administer oxygen, assess circulation). Less than half the respondents (45%, n = 57) perceived themselves as highly competent in the intermediate skills (e.g. control haemorrhage, assist with endotracheal

Table 2
Self-perceived competency levels.

Questionnaire item	Least competent % (n)	Competent % (n)	Highly competent % (n)
Able to assess breathing: rate, effort, cyanosis [†]	2 (3)	28 (35)	70 (90)
Able to administer oxygen: cannula, mask, bag-valve-mask [†]	1 (1)	25 (32)	74 (94)
Able to prepare and assist with endotracheal intubation [#]	14 (18)	38 (48)	48 (61)
Able to perform needle decompression e.g. pneumothorax [*]	62 (77)	27 (33)	11 (14)
Able to assess circulation: pulses, skin colour, capillary refill, blood pressure, signs of bleeding [†]	0 (0)	27 (34)	73 (94)
Able to control haemorrhage: apply tourniquet, fracture splint, pelvic wrap [#]	19 (24)	34 (43)	47 (60)
Able to administer local anaesthetic and apply sutures [*]	42 (52)	31 (39)	27 (33)
Able to manage shock: obtain intravenous/intraosseous access and administer fluids [#]	10 (12)	46 (58)	44 (56)
Able to assess mental status: monitor Glasgow Coma Scale [†]	4 (5)	32 (41)	64 (81)
Able to perform cardiopulmonary resuscitation [†]	11 (14)	37 (46)	52 (65)
Able to obtain and interpret echocardiograms: detect arrhythmias e.g. atrial fibrillation [*]	45 (57)	39 (49)	16 (21)
Able to prepare and administer drugs in cardiac arrest [#]	20 (24)	38 (49)	42 (54)
Able to prepare and administer thrombolytics [*]	38 (47)	33 (41)	29 (37)
Able to perform cardioversion/defibrillation [†]	42 (53)	38 (49)	20 (25)

[†] Basic skills.[#] Intermediate skills.^{*} Advanced skills.

intubation, manage shock). A large number of respondents (46%, n = 59) perceived themselves as least competent in advanced skills (e.g. defibrillation/cardioversion, interpreting an ECG).

When determining the relationship between the category of nurse and perceived competency, the p value was 0.001. Registered nurses appeared to be more competent than enrolled nurses. When comparing the years of experience and perceived competency, the p value was 0.027. Respondents with more years of experience had higher competency levels. There was no significance reported for the hospital sector; i.e. nurses in a state or private hospital (p = 0.52) against competency level.

Educational needs

Respondents rated their educational needs in relation to six areas, namely trauma, cardiac, neurological, respiratory, short courses and equipment (Table 3).

The mean score was 100, thus reflecting a high educational need. More than half of the respondents (62%, n = 79) scored higher than the mean score of 100 for educational needs and the lowest score was 41. Thirty percent of the respondents (n = 38) scored 117 indicating educational needs for all the competencies listed. Overall, 72% (n = 92) agreed that emergency education was a need; only 10% (n = 13) disagreed and 18% (n = 23) neither agreed nor disagreed. A Chi Square test was done to determine the educational needs between private and public institutions, which was not significant (p = 0.409).

Of those respondents (100%, n = 97) who rated their needs relating to equipment, 57% (n = 54) indicated they needed information regarding ventilators/oxylogs, 27% (n = 26) for the defibrillator, 25% (n = 24) for the ECG machine, 12% (n = 12) for the arterial blood gas machine and 4% (n = 4) for intubation equipment.

In relation to the six topics (trauma, cardiac, neurological, respiratory, short courses, and equipment), there was no difference in educational needs between the public sector and the private sector (p value = 0.409). Learning needs of enrolled nurses were significantly greater than those of registered nurses (p value = 0.53)

Discussion

The majority of the respondent nurses working in the ECs did not have any formal education/training in emergency nursing, and almost half the respondents scored less than the mean score, indicating low self-perceived competency levels overall. These findings are in keeping with other studies conducted in Africa that have drawn attention to the educational deficiencies of nurses in the emergency departments

Table 3
Educational needs.

Educational needs	Disagree % (n)	Neither agree nor disagree % (n)	Agree % (n)
<i>Educational needs: Trauma</i>			
Abdominal trauma e.g. intra-abdominal bleed	8 (10)	14 (17)	79 (98)
Paediatric emergencies	7 (9)	14 (17)	79 (98)
Head injuries e.g. intracranial bleeding	11 (14)	14 (18)	74 (94)
Spinal cord injuries	7 (8)	18 (22)	71 (91)
Burns and traumatic injuries	12 (15)	19 (24)	69 (89)
Orthopaedic e.g. compartment syndrome	11 (14)	21 (26)	68 (84)
Ophthalmic injuries	12 (15)	21 (25)	67 (81)
Obstetrics/gynaecology/pregnancy	10 (13)	25 (31)	65 (81)
Geriatric emergencies	14 (17)	24 (30)	62 (76)
<i>Educational needs: Cardiac</i>			
Acute Coronary Syndrome	9 (11)	10 (13)	81 (101)
Cardiogenic Shock	7 (9)	13 (16)	80 (101)
Arrhythmias	6 (8)	18 (22)	76 (94)
Cardiac Medications	10 (12)	14 (18)	76 (94)
Acute Myocardial Infarctions	12 (15)	14 (17)	74 (93)
Defibrillation/Cardioversion	13 (16)	18 (23)	69 (86)
<i>Educational needs: Neurological</i>			
Intra Cranial Haemorrhage	12 (15)	14 (17)	74 (93)
Stroke	13 (16)	18 (23)	69 (86)
Meningitis	17 (21)	20 (25)	63 (71)
Headaches	19 (24)	23 (28)	58 (71)
<i>Educational needs: Respiratory</i>			
Ventilators	6 (7)	14 (18)	80 (102)
Arterial Blood Gas Analysis	10 (13)	12 (15)	78 (99)
Chronic Obstructive Pulmonary Disease	14 (17)	18 (23)	68 (85)
Pulmonary Embolism	12 (15)	21 (26)	67 (83)
Breath Sounds	15 (19)	21 (26)	64 (80)
Asthma	17 (21)	21 (27)	62 (77)
Pneumonia	17 (22)	24 (30)	59 (74)
<i>Short courses</i>			
Advanced Cardiac Life Support (ACLS)	2 (3)	14 (18)	83 (105)
Disaster/emergency preparedness	7 (9)	11 (14)	82 (101)
Paediatric Advanced Life Support (PALS)	1 (1)	19 (24)	80 (100)
Poisoning	6 (8)	14 (17)	80 (100)
Triage	8 (10)	13 (16)	79 (98)
Pre-hospital Trauma Life Support (PHTLS)	6 (8)	15 (19)	79 (99)
Street Drugs	5 (6)	20 (26)	75 (95)
Pain Management	9 (11)	17 (22)	74 (94)
Pharmacology	5 (6)	21 (26)	74 (93)
Diabetes Update	8 (10)	19 (24)	73 (92)
Sexual assault/violence	13 (17)	16 (20)	71 (90)
Wound Care	10 (12)	21 (27)	69 (87)
Mental health	9 (11)	23 (29)	68 (87)

[16,18–20].

Although the majority of the respondents (67%, n = 85) perceived themselves as highly competent for basic skills, it is of concern that this drops to 52% (n = 65) for the essential emergency care skill 'Able to perform cardiopulmonary resuscitation'. Cardiopulmonary resuscitation (CPR) is a critical component of basic life support as the first-line response to cardiac or respiratory arrest. It is within the competence of both registered and enrolled nurses to assume full responsibility and accountability for providing emergency care, and of nursing auxiliaries to render basic first aid [21]. Researchers in Botswana similarly found significantly low levels of CPR skills among registered nurses and suggested that this should be addressed by instituting country-wide CPR training and regular refresher courses [19]. Respondents in our study also indicated that they were not highly competent for 'Able to assess mental status: monitor Glasgow Coma Scale'. The Glasgow Coma Scale

(GCS) is a rapid assessment tool developed to objectively assess the level of consciousness or the neurological status of patients in the clinical setting. Nurses should be knowledgeable and confident in GCS assessment and management to recognising deterioration [22].

In relation to intermediate emergency nursing skills, the respondents perceived themselves as least competent for 'Able to prepare and administer drugs in cardiac arrest'. This is of concern as nurses are required to have pharmacological knowledge of indications and side effects of these drugs as well as correct doses, routes and frequency. Resuscitation is a very complex area which requires a great deal of interdisciplinary collaboration and team work. Terzi [23] notes that the role of the nurse during resuscitation has continued to evolve and extends to issues that include rapid response nursing, using external defibrillators, nurse's involvement in CPR decision-making ('Do Not Attempt Resuscitation' [DNAR] decisions), understanding the drugs used during cardiac arrest response, and nurses' involvement in regard to witnessed resuscitation (family support nursing).

Less than a third of the respondents perceived themselves as being competent in performing advanced skills (ECG interpretation, defibrillation). These are considered by many to be core emergency care skills needed for prompt diagnosis and treatment of emergency patients, and authors agree that defibrillation should be included in the scope of practice for emergency nurses [24,25]. A study in the Western Cape, South Africa, revealed that only 13% of nurses had defibrillator training, compared to 88% of doctors [24]. The same study further revealed that only 58% of EC nurses had ever used a defibrillator. Fourteen percent were aware of the correct energy setting, 18% knew the indications for defibrillation, and only 6% were aware of the indications for cardioversion [24]. Researchers have reported that nurses lack confidence and are afraid of operating a defibrillator due to lack of knowledge [26].

In managing life-threatening injuries, it is crucial for emergency nurses to understand the mechanisms of injury, the significance of injury history, and how to conduct physical examination and diagnostic tests [27]. Life-threatening injuries need to be identified immediately through comprehensive physical assessment [27]. Trauma is a major cause of unnatural deaths, and in South Africa one-third of all emergency patients suffer trauma, compared with just 8% and 12% in the United Kingdom and the United States respectively [28]. The incidence of unrecognised abdominal trauma can be reduced by provision of trauma courses to enhance nurses' skills and knowledge [27]. Spinal cord injuries can result in complete paralysis, and knowing how to do spinal immobilisation is crucial for emergency nurses in prevention of additional injury. Burns trauma requires specific management, and emergency nurses should also be proficient in the various protocols for burns management and have knowledge of burns pathophysiology [29]. Management of traumatic brain injuries (TBI) is crucial in the resuscitation phase, and to counter emergency nurses' lack of knowledge and skills in TBI management they need to be given training in using TBI protocols [30]. Similar lack was also evident in our study. Paediatric emergencies are unique due to anatomical and physiological differences between adults and children; emergency nurses need to be knowledgeable about these differences, since paediatric patients can deteriorate rapidly if not assessed and managed properly.

The findings in our study highlight pressing educational needs of emergency nurses, similar to findings by Nyhus and Kamara [20] in a study carried out in Sierra Leone. In an Australian study showing urgent need for education and training in emergency nursing, preference was indicated for ongoing professional development using scenario-based, context-specific education [15]. Familiarity with care bundles can help to promote consistent, evidence-based emergency nursing care [31] and educational hand-outs, demonstrations and updated protocols can also enhance nurses' knowledge and skills [30].

Keeping up to date with current evidence-based practice is best achieved through continuing professional development and follow-up. Basic life support (BLS), advanced cardiac life support (ACLS),

paediatric advanced life support (PALS) and triage have been listed as mandatory topics for continuing education [9]. ACLS certification is a highly desirable qualification for emergency nurses; knowledge of ACLS protocols is potentially life-saving in maintenance of neurological function during cardiovascular events such as strokes. PALS certification for emergency nurses reinforces systematic handling of assessment and management in paediatric emergencies. PALS courses have been shown to significantly increase nurses' knowledge of paediatric resuscitation [32]. Skill and knowledge retention is also an important issue because these deteriorate over time and training should be provided to prevent this [19].

Training in short courses such as triage, ACLS and PALS is particularly advisable for nurses working in ECs. Triage is the cornerstone of prioritising patients in ECs, yet many nurses are not competent in using the acuity assessment tool. Aloyce, Leshabari and Brysiewicz [18] confirm that nurses in Tanzania lack triage knowledge in their finding that more than 50% of nurses did not know what category to assign and were not aware of triage category waiting times. The South African Triage Scale (SATS) had a 96% correct triage rate when used in Pakistan [33] and is currently used throughout South Africa. Nurse triage studies have shown reduced waiting times, with Bateman [33] reporting a reduction from 216 min to 38 min for red-triaged patients. SATS is an invaluable tool that has been adopted by a global medical humanitarian organisation, Médecins Sans Frontières, to triage patients in ECs in other violent settings internationally. Aloyce et al. [18] recommend the adoption of formal unit-based training sessions to enhance triage skills and knowledge in ECs.

The study however, was limited to four hospitals in KwaZulu-Natal, South Africa, which restricts generalisation in regard to the educational needs of emergency nurses in other areas. This was a self-reported assessment and no actual measurement of competencies or knowledge was carried out.

The study has highlighted numerous perceived educational needs in emergency nursing practice. A stronger support system for nurses may contribute to improving confidence, knowledge base and enhance current skills and competencies. Short courses, regular evidenced-based updates and in-service education may be beneficial for emergency nurses not otherwise able to take time off work for formal studies. Clinically relevant and focused nurse education is essential to develop competent emergency nurses. Further research on educational needs in other provinces and an evaluation of current knowledge and competencies may provide insight on how best to improve the current situation.

In conclusion, the findings of this study reflect a deficit in perceived competency levels, skills and knowledge among the majority of emergency nurses. There is clearly a need for educational development to improve basic, intermediate and advanced skills of emergency nurses. Establishment of recognised training programmes for emergency nursing would be a positive step towards improvement in nurses' self-perceived knowledge and competency gaps.

Conflicts of interest

The authors declare no conflicts of interest. PB is an editor of this journal, but was not involved in this paper's editorial process.

Dissemination of Results

Results have been shared informally with the hospitals involved in the study. Once published, the article will be shared with the local hospitals. Findings will be presented at national meetings.

Author contributions

RD and PB conceptualised and designed the study. RD collected the data, and both authors analysed the data. RD and PB drafted and

approved the manuscript for submission.

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