

Medico-legal aspects regarding drunk driving: experience and competency in practice of community service doctors

L Fouché^a, J Bezuidenhout^a, C Liebenberg^b and AO Adefuye^{a*} 

^aDivision Health Sciences Education, Office of the Dean, University of the Free State, Bloemfontein, South Africa

^bDepartment of Forensic Medicine, School of Medicine, University of the Free State, Bloemfontein, South Africa

*Corresponding author, email: adefuyeao@ufs.ac.za



Background: Drunk driving has been reported to increase the risk of road traffic accidents associated with death and severe injury. In South Africa, an increase in blood alcohol concentration of as little as 0.01 g per 100 ml above the legal limit may warrant criminal prosecution or the denial of an insurance claim for damages. However, multiple court cases have been withdrawn because of the incompetence of officials at various stages of the investigation. The scope of the mistakes range from poor scene handling to the incorrect handling of blood samples at the laboratory to eventual laboratory testing of blood samples. Using a group of community service doctors (CSDs) as a cohort study group, this study investigated the competency of medical graduates in relation to the medico-legal aspects of drunk driving.

Methods: A self-administered questionnaire-based study was done with 150 CSDs. The questionnaire was administered in Afrikaans and English and was dispatched electronically via e-mail. All potential participants were contacted telephonically to obtain verbal consent. Results are displayed as percentages.

Results: A response rate of 59.3% was achieved. The results obtained in this study confirm that some CSDs lack competency in handling medico-legal aspects relating to drunk driving, and are thus unable to serve the communities they have been assigned to adequately. Their lack of skills and knowledge suggests that the present undergraduate Clinical Forensic Medicine curriculum is inadequate.

Conclusion: It would be beneficial to revise the curriculum for Clinical Forensic Medicine in undergraduate medical training to address the gap in knowledge and practice of various demands of forensic medicine required from new medical graduates and CSDs.

Keywords: blood alcohol concentration, clinical forensic medicine, community service doctors, drunk driving

Introduction

Consumption of alcoholic beverages is a worldwide phenomenon,¹ and has been an essential part of many cultures for thousands of years.² According to the World Health Organization (WHO) Global Status Report on Alcohol and Health (2011), 6.13 litres of pure alcohol was consumed on average by every person in the world aged 15 years or older in 2005 (worldwide per capita consumption). The highest consumption levels were found in the developed world, while medium consumption levels were found in Southern Africa, where Namibia and South Africa had the highest levels.¹ A pattern of alcohol abuse, ranging from daily heavy drinking to occasional episodes of hazardous drinking, has been closely linked to significant public health and safety problems in nearly all countries.³ It has been reported that the harmful use of alcoholic beverages is among the top five risk factors for disease, disability and death globally.⁴ Driving while under the influence of alcohol has been reported to increase the risk of road traffic accidents associated with death and severe injury.⁵ Hence, laws enforcing drunk driving countermeasures are considered to be cost-effective strategies for reducing the burden of alcohol-attributable traffic accidents.⁶ Determining blood alcohol concentration (BAC) (the concentration of alcohol by volume in the bloodstream) limits for drivers, conducting sobriety checks and random breath testing can reduce traffic crashes by roughly 20%.^{7,8}

In South Africa, the specified legal BAC limit for drivers of motor vehicles is 0.05 g of ethyl alcohol per 100 ml of blood.⁹ Thus, an increase of as little as 0.01 g per 100 ml in BAC value above the

legal limit may warrant criminal prosecution or the denial of an insurance claim for damages.⁹ There is no doubt that criminal prosecutions of inebriated drivers have, in recent years, received much attention. However, multiple court cases have been dismissed as a result of pure incompetence, ranging in origin from the roadside to the eventual laboratory testing of blood samples.¹⁰ This state of affairs undermines the constitutional rights of accused individuals, results in extended delays in settling disputes or claims for insurance payouts and, in some cases, settlement of the estates of deceased individuals, all of which could cause enormous financial hardship to dependants or beneficiaries.⁹ In 2015, it was reported that 44 526 cases of drunk driving had been withdrawn from South African courts in the 2012/2013 financial year; reasons included inappropriate blood sample retention and storage, and invalid sample analysis.¹¹ Medical practitioners are often requested by police officials to take blood samples from persons who are suspected of driving under the influence of alcohol.

Hence, using a group of community service doctors as a cohort study group, this study investigated the competency of medical graduates regarding the medico-legal aspects of drunk driving, with the aim of identifying gaps in knowledge and shortcomings in undergraduate medical training in clinical forensic medicine.

Methods

A self-administered questionnaire-based study included 150 community service doctors (CSDs), who were medical graduates of the School of Medicine, Faculty of Health Sciences, University of the Free State (2005–2007). A comprehensive list containing

names and contact details of all 150 CSDs was sourced from the administration of the Faculty of Health Sciences, University of the Free State, and the Health Professions Council of South Africa. All potential participants were contacted telephonically to obtain verbal consent.

The questionnaire was administered in Afrikaans and English and was dispatched electronically via e-mail. The data collected included the following:

- demographic details: age, gender and home language;
- professional profile;
- employment profile: when and where the participant completed community service;
- competency regarding assessment and completion of medico-legal documentation of patients accused of driving under the influence of alcohol (DUI) encountered during participants' community service year.

A three-point Likert scale was used (Yes, always, Yes, sometimes, and No).

The response rate was 59.3% (89 of the initial 150 questionnaires distributed were returned). The results were captured on Microsoft Excel®, 2013 (Microsoft Corp, Redmond, WA, USA), and calculated by a statistician. A Spearman's correlation coefficient analysis (SPSS® Statistics 24, IBM Corp, Armonk, NY, USA) was done to determine the relationship between exposure to undergraduate training in medico-legal documentation of drunk-driving cases and determinants of competency such as appropriate history taking, examination and performance of other test on alleged drunk drivers.

Ethical approval was given by the Ethics Committee of the Faculty of Health Sciences University of the Free State (HSREC 149/2011).

Results

Demographic details of participants

Participants were aged between 27 and 35 years, with the majority (76.2%, $n = 67$) between 27 and 29 years old. There were 55 (61.8%) female and 34 (38.2%) male participants. Furthermore, 73% ($n = 65$) were Afrikaans speaking, 14 (15.7%) were English speaking and 11.2% ($n = 10$) had other languages as their first language.

In terms of placement, the majority 39.3% ($n = 35$) of the participants did their community service in the Free State province

Table 1: Province of community service by participants

Province of community service	%
Western Cape	7.9
Eastern Cape	10.1
Northern Cape	12.4
North-West	13.5
Gauteng	6.7
Mpumalanga	5.6
Limpopo	1.1
Free State	39.3
KwaZulu-Natal	3.4

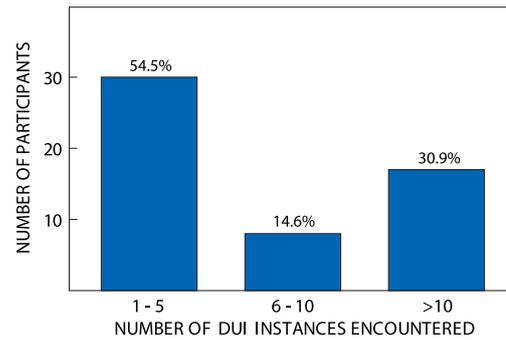


Figure 1: Number of instances of alleged drunk driving encountered by participants during their community service year ($n = 55$).

(Table 1). Furthermore, 47.2% of the respondent CSDs were posted to urban communities, 27% of the participants served in mixed urban–rural communities, whilst the remainder of participants (25.8%) did their community service in a rural setting.

Instances of alleged drunk driving encountered during year of community service

Participants were asked whether they had encounters with instances of alleged drunk driving during their year of community service. Of the 87 respondents who responded to this question, 63.2% ($n = 55$) reported that they had, during their community service, had encounters with people suspected to have been driving under the influence of alcohol, while 36.8% ($n = 32$) answered the question in the negative. The majority of participants (54.5%, $n = 30$) who reported having encountered allegedly drunk drivers stated they had seen between one and five cases (Figure 1).

Medico-legal aspects related to drunk driving

In attending to an alleged drunk driver, the medical practitioner has to be certain that the individual presented by the police official has, in fact, been arrested, or charged with or convicted of a crime, before engaging in any medical procedure or examination requested by the police official.¹² In this study, 88.8% ($n = 48$) of the respondents reported that alleged drunk drivers were, at all times, accompanied by a member of the South African Police Service (SAPS), who confirmed arrest and charge (Table 2).

Table 2: Observations prior to examination and sample taking

Item	Yes, always (%)	Yes, sometimes (%)	No (%)
Accompanying member of the South African Police Service*	88.8	9.3	1.9
Accompanied by necessary documentation (SAPS 308(A))	78.2	16.3	5.5
Alleged drunken driver brought in within 2 h of incident*	33.3	64.8	1.9
Obtaining consent for examination and collection of blood sample	50.9	29.1	20

* $n = 54$.

In addition, prior to any examination or intervention, the medical practitioner should receive from the police a written request for the examination of the arrested person (Form SAPS 308(a)).¹² When asked whether the alleged drunk drivers were accompanied by the SAPS 308(a) form, 78.2% ($n = 43$) of the participants reported that alleged drunk drivers were always accompanied by the SAPS 308(a) form, while 5.5% ($n = 3$) of the participants said the alleged offenders had not been accompanied by the form (Table 2).

During any prosecution for an alleged contravention of Sections 65(2) or 65(5) of the Road Traffic Act, it must be proved that the concentration of alcohol in any specimen of blood exceeded 0.05 gram per 100 millilitres within two hours after the alleged contravention.¹³ In this study, only 33.3% ($n = 18$) of the participating CSDs reported that allegedly inebriated driver(s) were brought to the healthcare facility within two hours of the alleged contravention, while the majority (64.8%) of the participants reported that alleged offenders were sometimes (not always) presented within two hours of the alleged contravention (see Table 2).

Because the alleged offender is under arrest when he/she is presented at the healthcare facility, his/her consent is not necessary and physical constraint by the police official/arresting officer may be required to assist the doctor to take a blood sample.¹² However, the medical practitioner should bear in mind that, as with any other medical examination, the patient's welfare is paramount and it is advisable that the patient's consent be obtained as far as possible.¹² Of the 55 participants who handled alleged instances of DUI during their year of community service, only 50.9% ($n = 28$) reported always obtaining consent from the patient (see Table 2).

Taking a blood sample to determine blood alcohol level

BAC has become the mainstay for the prosecution of drunk-driving cases. A sample of blood must be obtained from the alleged offender within two hours of the alleged contravention and the concentration of alcohol in this sample is then measured. Prior to taking the blood sample, the skin on the area where blood is to be taken has to be cleaned and prepared according to standard medical practice i.e. maintaining infection control measures by disinfecting the skin. However, it is of utmost importance that the attending medical practitioner is aware that the area where blood is to be taken should be cleaned with a substance not containing alcohol, in contrast to standard medical practice. Almost all the participants, that is, 96.2%, reported always cleaning the area where the blood sample is to be taken; 7.4% reported that they sometimes clean the area (51 participants responded to this question). However, when asked about the substance they used to clean the area, 76.4% ($n = 39$) reported cleaning with sterile water, 21.6% ($n = 11$) reported cleaning with alcohol, whilst 2% ($n = 1$) reported cleaning with other substances (Figure 2).

Maintaining chain of evidence

For successful prosecution of DUI cases, blood sampling is the gold standard. This must, however, be done properly by qualified personnel, and the chain of evidence must be maintained.¹⁰ Data from this study show that, in 80% of instances where participants encountered people accused of driving while drunk, the accused were always accompanied by the necessary alcohol kit (Table 3). In addition, 85% of the participants reported that they always check the kit beforehand, whilst 94.3% reported always personally breaking the seal of the alcohol kit (Table 3). Following sample collection, specimens are transferred, avoiding

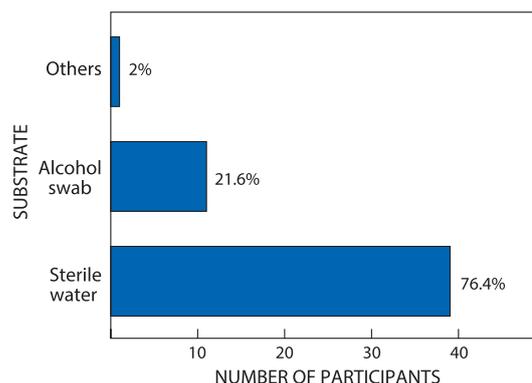


Figure 2: Substance used to clean area where blood is to be taken ($n = 51$).

Table 3: Steps in maintaining the chain of evidence

Item	Yes, always (%)	Yes, sometimes (%)	No (%)
Accompanied by necessary alcohol kit ($n = 55$)	80	14.5	5.5
Checking the kit beforehand ($n = 53$)	85	7.5	7.5
Personally breaking the seal ($n = 53$)	94.3	3.8	1.9
Sealing the kit personally ($n = 53$)	94.3	1.9	3.8
Handing documentation and alcohol kit to investigating officer ($n = 50$)	96	0	4

contamination, to a sterile McCartney bottle containing anticoagulant (sodium fluoride and potassium oxalate), then into a labelled bag, sealed and handed to the investigating officer. He/she sign to acknowledge receipt of the specimen and then transport it to the testing laboratory. When asked whether they seal the kit personally after blood collection, the majority (94.3%) of participants reported that they always seal the kit

Table 4: History taking and examination of drivers suspected to be inebriated

Item	Yes, always (%)	Yes, sometimes (%)	No (%)
Taking of medical history ($n = 47$)	65.9	21.3	12.8
Asking about medication usage in the previous 24 h ($n = 48$)	54.1	31.3	14.6
Previous injuries, abnormalities and operations ($n = 48$)	50	33.3	16.7
Alcohol/drug consumption over the previous 24 h ($n = 48$)	81.2	12.5	6.3
Performing a full clinical examination ($n = 48$)	66.6	16.7	16.7
Completing the necessary documentation ($n = 48$)	93.8	4.2	2
Signing of documentation ($n = 46$)	97.8	2.2	0

Table 5: Undergraduate training and exposure to medico-legal documentation of drunk-driving cases

Item	Yes (%)	No (%)
Trained to complete documentation for drunk-driving cases at undergraduate level (n = 54)	11.1	88.9
Undergraduate exposure to drunk-driving cases (n = 55)	10.9	89.1

personally after sample collection (Table 3), whilst 96% reported that they always hand over documentation and the alcohol kit to the investigating officer (Table 3).

History taking and examination for drivers suspected to be inebriated

It is important for the medical practitioner to ascertain and record in writing that the impairment of the allegedly inebriated driver is due to alcohol consumption.¹² In order to ascertain this properly, a detailed history and full clinical examination is needed. Data collected from the questionnaires reveals that 65.9% of the participants reported that they always take a medical history, whilst 12.8% reported that they did not take medical history (Table 4). According to Section 37(2) of the Criminal Procedure Act of 1977:

‘... any medical officer of any prison or any district surgeon or, if requested thereto by any police official, any registered medical practitioner or registered nurse may take such steps, including the taking of a blood sample, as may be deemed necessary in order to ascertain whether the body of any person referred to in paragraph (a) (i) or (ii) of subsection (1) has any mark, characteristic or distinguishing feature or shows any condition or appearance.’

In this study, 50% of the participants reported that they always inquired about previous injuries, abnormalities and operations, 33.3% reported that they sometimes asked about these, whilst 16.7% reported that they did not inquire about any previous injuries, abnormalities and operations (see Table 4). If, in the professional opinion and experience of the doctor, the reason for the patient's impairment could be the result of other factors, for example, drugs, hypoglycaemia, head injury or mental illness, it is important that it is recorded as such.¹² To rule out drug-related impairment, the history of a patient's intake of medication in the 24 h prior to presentation is of utmost importance. In this study, only 54.1% of the participants reported that they always took a history of medication used in the 24 h prior to arrest (Table 4). Furthermore, a full clinical examination is required to exclude impairment secondary to head trauma. A full clinical examination was always performed by 66.6% of the participants, whilst 16.7% of them sometimes performed a full clinical examination (see Table 4).

Table 6: Spearman's correlation matrix showing relationship between undergraduate training and competency in practice by community service doctors

Item		a	b	c	d	e	f	g	h	
Spearman's rho	a	Correlation coefficient	1.000	1.000**	0.269	.324*	0.262	0.334*	0.359*	0.181
		Sig. (2-tailed)	–	–	0.067	0.017	0.072	0.020	0.012	0.219
		n	54	54	47	54	48	48	48	48
b	Correlation coefficient	1.000**	1.000	0.269	0.326*	0.262	0.334*	0.359*	0.181	
	Sig. (2-tailed)	–	–	0.067	0.015	0.072	0.020	0.012	0.219	
	n	54	55	47	55	48	48	48	48	
c	Correlation coefficient	0.269	0.269	1.000	0.879**	0.961**	0.617**	0.821**	0.738**	
	Sig. (2-tailed)	0.067	0.067	–	0.000	0.000	0.000	0.000	0.000	
	n	47	47	47	47	47	47	47	47	
d	Correlation coefficient	0.324*	0.326*	0.879**	1.000	0.853**	0.797**	0.875**	0.663**	
	Sig. (2-tailed)	0.017	0.015	0.000	–	0.000	0.000	0.000	0.000	
	n	54	55	47	55	48	48	48	48	
e	Correlation coefficient	0.262	0.262	0.961**	0.853**	1.000	0.560**	0.822**	0.794**	
	Sig. (2-tailed)	0.072	0.072	0.000	0.000	–	0.000	0.000	0.000	
	n	48	48	47	48	48	48	48	48	
f	Correlation coefficient	0.334*	0.334*	0.617**	0.797**	0.560**	1.000	0.819**	0.365*	
	Sig. (2-tailed)	0.020	0.020	0.000	0.000	0.000	–	0.000	0.011	
	n	48	48	47	48	48	48	48	48	
g	Correlation coefficient	0.359*	0.359*	0.821**	0.875**	0.822**	0.819**	1.000	0.709**	
	Sig. (2-tailed)	0.012	0.012	0.000	0.000	0.000	0.000	–	0.000	
	n	48	48	47	48	48	48	48	48	
h	Correlation coefficient	0.181	0.181	0.738**	0.663**	0.794**	0.365*	0.709**	1.000	
	Sig. (2-tailed)	0.219	0.219	0.000	0.000	0.000	0.011	0.000	–	
	n	48	48	47	48	48	48	48	48	

Notes: (a) Trained to complete documentation for drunk-driving cases at undergraduate level, (b) undergraduate exposure to drunk-driving cases, (c) taking of medical history, (d) obtaining consent for examination and collection of blood sample, (e) performing a full clinical examination, (f) asking about medication usage in the previous 24 h, (g) previous injuries, abnormalities and operations, (h) alcohol/drug consumption over the previous 24 h. *Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

When asked about completing and signing the necessary documentation, 93.8% and 97.8% of the participants reported that they always or sometimes completed and signed the necessary documentation, respectively (see Table 4).

Undergraduate training and exposure to medico-legal documentation for drunk-driving cases

Data collected by this study reveal that only 11.1% of participants who indicated that they had encountered patients accused of drunk driving during their year of community service had, during their undergraduate training, received training on medico-legal documentation of drunken-driving cases (Table 5). Similarly, only 10.9% of the participants indicated that they had any undergraduate exposure to drunk-driving cases (Table 5).

Spearman's correlation analysis

Results obtained from the Spearman's correlation analysis revealed a strong positive correlation between undergraduate exposure to drunk-driving cases and training to complete documentation of drunk-driving cases at the undergraduate level ($r_s = 1.000$; $p < 0.01$) (Table 6). A weak positive correlation was found between exposure to undergraduate training in medico-legal documentation of drunk-driving cases and taking a relevant medical history ($r_s = 0.269$; $p = 0.067$) (Table 6). Similarly, a weak positive correlation was also found between exposure to undergraduate training in medico-legal documentation of drunk-driving cases and performing full examination on alleged inebriated drivers ($r_s = 0.262$; $p = 0.072$) (Table 6).

In addition, a strong positive correlation was recorded between taking a relevant medical history and taking a history of medication usage in the previous 24 h, history of previous injuries, abnormalities and operations and history of alcohol/drug consumption over the previous 24 h, respectively ($r_s = 0.617$, 0.821 and 0.738 , respectively; $p < 0.01$ in all cases) (see Table 6). Furthermore, the results presented in Table 6 show a very strong positive correlation between obtaining consent for examination and performing a full clinical examination ($r_s = 0.875$; $p < 0.01$). Other correlation values are also presented in Table 6.

Discussion

Since the arrival of the European settlers at the southern tip of Africa in the year 1652,¹⁴ alcohol has played a central and often controversial role in the life of many South Africans.¹⁵ The establishment of a refreshment station for passing ships at what was to become Cape Town meant that drunkenness, gambling and violence were soon part of the daily lives of many inhabitants. Members of the indigenous population caught on quickly and started to exchange alcohol for cattle and labour.¹⁵ The seventeenth and twentieth centuries saw the growth of extensive wine and brewing industries in South Africa and the establishment of illegal drinking outlets (*shebeens*) amongst black communities became problematic.¹⁵

Today South Africa has the highest levels of alcohol consumption in the southern African region,³ with the total level of adult pure alcohol per capita consumption estimated at 32.8 l for men and 16.0 l for women in 2010.⁶ Patterns of drinking range from frequent drinking at times not part of meals, drinking in public places, communal drinking, and drinking at family/community events,¹⁵ to heavy episodic drinking (consumption of 60 or more grams of pure alcohol per single occasion) over weekends.¹⁶ Although habitual light to moderate alcohol intake is associated with a decreased risk of total mortality in certain medical conditions, such as coronary artery disease, diabetes mellitus, congestive

heart failure, and stroke,¹⁷ alcohol consumption has been identified as a component cause for more than 200 diseases, injuries and other health-conditions with ICD (International Statistical Classification of Diseases and Related Health Problems)-10 codes.¹⁸ In South Africa, alcohol is the third most common cause of disability and death, after sexually transmitted infections and interpersonal violence, both of which are themselves influenced by alcohol abuse.¹⁹ In 2000, the health, social and economic burden of South Africa's alcohol crisis could be seen in the 36 840 deaths, 787 749 years of life lost, and 344 331 years lived with a disability attributable to alcohol in that year.²⁰

According to the WHO global status report on road safety, over 1.2 million people die each year on the world's roads, and between 20 and 50 million suffer non-fatal injuries.⁵ The WHO reports that over 90% of all fatalities on the roads globally occur in low- and middle-income countries, which have an estimated road fatality rate of 21.5 and 19.5 per 100 000 population, respectively, compared with 10.3 per 100 000 recorded in high-income countries.⁵ The risk of dying as a result of a road traffic injury is highest in the African region (24.1 per 100 000 population), and lowest in the European region (10.3 per 100 000).²¹ According to South Africa's transport minister, a road traffic fatality rate of 23.5 per 100 000 people was reported in 2014, compared with the global average of 17.4 fatalities per 100 000 people for that year.²² It can thus be said that road fatalities have denied many South African families economic freedom, as many of the people injured or killed on the roads were breadwinners and important contributors to the economy at large.²²

Drunk driving increases the risk of being involved in a road traffic accident and increases the severity of resulting injuries. It has been reported that the level of impaired driving and the risk of crash involvement is directly proportional to the amount of alcohol consumed.²¹ Of the road traffic fatalities in South Africa in 2012, 52.2% of the deaths of adult males and 11.6% of those of adult females can in some way be attributed to alcohol.⁵ Laws enforcing measures to prevent and punish drunk driving, such as the introduction of BAC limits for drivers, have been shown to reduce the burden of alcohol-attributable traffic accidents.⁶ It is reported that a BAC of 0.05 g/dl will cause impairment in the vast majority of adult drivers, while someone with a BAC level of 0.1 g/dl faces five times the risk of being involved in a road traffic accident than someone with BAC level of zero.²³ According to the WHO report, 89 countries, with a total population of 4.55 billion people (66% of the world's population), now have comprehensive drink-driving laws. Best practice dictates that the BAC limit must be 0.05 g/dl or less.²⁴

According to Section 65 Subsections 2 and 5 of the South African Road Traffic Act, 'no person shall drive a vehicle, or occupy the driver's seat of a motor vehicle of which the engine is running, on a public road, respectively while the concentration of alcohol in any specimen of blood taken from any part of the person's body is not less than 0.05 gram per 100 millilitres, or in the case of a professional driver referred to in section 32, not less than 0.02 gram per 100 millilitres, or while the concentration of alcohol in any specimen of breath exhaled by such person is not less than 0.24 milligrams per 1000 millilitres.'²⁵ However, enforcing prosecution under this law is not common in South Africa, as many drunk-driving court cases have been dismissed as a result of the state's inability to present credible evidence—this failure is accredited to members of the SAPS and the Department of Health.¹⁰ Medical practitioners, in particular young or newly graduated medical practitioners working as CSDs, are indispensable members of the Department of Health's workforce.

The aim of this study was to assess the competencies of this group of medical practitioners in relation to medico-legal documentation of patients who had allegedly been driving under the influence of alcohol, to identify gaps in knowledge and shortcomings in practice. This enabled reflection on the adequacy of the undergraduate medical training presently available in clinical forensic medicine.

In the present study, 63.2% ($n = 55$) of the participating CSDs had encountered people who were alleged to have driven drunk during their year of community service; the majority (54.5%, $n = 30$) reported having managed between one and five cases during that time (see Figure 1). The majority of participants (47.2%) were required to perform their community service in urban communities (see Table 1).

For the successful prosecution of a drunk driver, the clinical evaluation and examination of an accused by an expert witness is usually conducted by the medical practitioner on request by the police officer by way of a formal SAP 308(a) request form.²⁶ It was found in this study that the SAP 308(a) request form was presented in only 78.2% of cases, never presented in 5.5% of the cases and, in 16.3% of the cases examined by the participants, presented sometimes (see Table 2). This shows that the SAPS officers are either uninformed or untrained and also provides evidence of the gap in knowledge on the side of the medical practitioners.

The clinical evaluation and examination must always be done in a well-lit room. It begins with general observation of the patient to determine signs and symptoms of intoxication, such as smell of alcohol, an increased respiratory rate, diminished alertness and memory loss, photophobia, blurred vision and abdominal pain.²⁷ This observation must be followed by a clinical examination, to exclude any form of injury or trauma to the head or other parts of the body. Particular attention should be paid to the ingestion of any medication and any relevant medical history (e.g. psychiatric illness) must be noted. During the clinical evaluation, the doctor should ascertain whether the patient's faculties are indeed impaired, try to assess the degree of impairment; try to assess whether the accused is fit to drive a motor vehicle with the necessary skill and care required and whether the impairment can be wholly or partly due to alcohol consumption.²⁶ The doctor must ensure that the examination is conducted in a just and proper manner and that the evidence collected adheres to the procedures for admissibility in a court of law.²⁶ Data presented by this study show that only 65.9% of the participating CSDs attested to taking a proper medical history every time they had to examine someone accused of drunk driving (see Table 4), while only 54.1% of the participants reported that they enquired about the recent intake of medication. It was unexpected and disturbing that 16.7% of the participants never performed full clinical examinations on these patients (Table 4). Findings from the Spearman's correlation analysis show a positive correlation between exposure to undergraduate training in medico-legal documentation of drunk-driving cases and taking a proper medical history and performing a full clinical examination (see Table 6). This suggests that adequate undergraduate training will ensure that CSDs take relevant medical history and perform full clinical examinations when attending to alleged inebriated drivers (Table 6). The findings that the medical practitioner makes should be recorded on an appropriate form (Health 475, GW4/75),²⁸ which was done by 93.8% of the participants (Table 4). Although the value of the clinical evaluation and examination by qualified medical personnel has been questioned in court, clinical evaluation and

examination still has an important place in the medico-legal investigation of drunk driving. This was shown in the case of *S v. Conradie* 2000(2) SACR 386 cited in Le Roux,²⁶ in which the clinical findings and clinical opinion were found to supersede the BAC result, causing the court to conclude that the blood analysis must have been faulty.

Furthermore, Section 65 Subsection 3 of the South African Road Traffic Act of 1996²⁵ states that:

'If, in any prosecution for an alleged contravention of a provision of subsection (2), it must be proved that the concentration of alcohol in any specimen of blood taken from any part of the body of the person concerned was not less than 0.05 gram per 100 millilitres at any time within two hours after the alleged contravention, it shall be presumed, in the absence of evidence to the contrary, that such concentration was not less than 0.05 gram per 100 millilitres at the time of the alleged contravention, or in the case of a professional driver referred to in section 32, not less than 0.02 gram per 100 millilitres, it shall be presumed, in the absence of evidence to the contrary, that such concentration was not less than 0.02 gram per 100 millilitres at the time of the alleged contravention.'²⁵

Findings from this study revealed that 33.3% of the participants reported that the alleged drunk drivers always presented within two hours of incident, while 64.8% of participants reported that people accused of driving drunk were sometimes presented within the two-hour time frame. A BAC sample collected more than two hours after the incident will give an unreliable result, which will not be admissible in a court of law, thus suggesting that a guilty verdict would be unlikely.

In addition, Section 65 Subsection 4 of the Road Traffic Act further states that:

'... where in any prosecution in terms of this Act proof is tendered of the analysis of a specimen of the blood of any person, it shall be presumed, in the absence of evidence to the contrary, that any syringe used for obtaining such specimen and the receptacle in which such specimen was placed for despatch to an analyst, were free from any substance or contamination which could have affected the result of such analysis.'

During standard medical practice, any area where blood is to be taken should be kept sterile as far as possible, generally by making use of alcohol swabs. However, in taking a blood sample for a BAC test, preparing the skin area with an alcohol swab or any other substance that may affect the result is strongly prohibited. When asked what substance they used to clean the skin area, 76.4% ($n = 39$) of the participants reported cleaning it with sterile water, 21.6% ($n = 11$) reported cleaning with alcohol, and 2% ($n = 1$) reported cleaning with other substances (Figure 2). This indicated a lack of basic understanding among some participants of the principles governing sample collection while performing a BAC test and its legal importance in the prosecution of drunk drivers.

When collecting evidence or samples for clinical forensic purposes, maintaining the chain of evidence is of the utmost importance. It can be said that, for this study, the majority of the participants knew and adhered to the basic principles of maintaining the chain of evidence for medico-legal purposes (see Table 3).

Finally, findings from this study showed that only 11.1% of the participants had undergone any form of undergraduate training in completing documentation for drunk-driving cases, while only 10.9% reported having had any undergraduate exposure to allegedly inebriated drivers (see Table 5). This limited undergraduate training and exposure to medico-legal aspects regarding drunk driving can be responsible for the incompetency displayed by some CSDs in this study. Results obtained from the Spearman's correlation analysis revealed a strong positive correlation between undergraduate exposure to drunk-driving cases and training to complete documentation of drunk-driving cases at the undergraduate level (see Table 6). Similarly, positive correlations were observed between exposure to undergraduate training in medico-legal documentation of drunk-driving cases and other determinants of competency as seen in Table 6. It is therefore very likely that increased undergraduate exposure to drunk-driving cases will enhance competency in practice by CSDs. This finding, thus, indicates the need for a new curriculum for clinical forensic medicine in the MBChB programme to address the shortcomings in current training, and enhance skills and knowledge of medical graduates in relation to executing of medico-legal cases.

Conclusion

Taken together, findings from this study confirm that some officers in the employ of the SAPS and the DOH had an inadequate knowledge base and understanding of the effective handling of the medico-legal aspects regarding accusations of drunk driving. Alcohol-related road traffic accidents are notoriously associated with repeat offenders.²⁹ It would, therefore, be beneficial to direct a new curriculum for clinical forensic medicine in the MBChB programme to address the gap in knowledge and practice of various topics of forensic medicine of newly qualified medical graduates and CSDs. In addition, it is recommended that members of the SAPS be properly trained in medico-legal aspects regarding drunk driving.

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ORCID

AO Adefuye  <http://orcid.org/0000-0003-2380-1487>

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