COMPETENCIES EXPECTED FROM A MEDICAL OFFICER IN PERFORMING MEDICO LEGAL DUTIES: THE RESULTS OF A DELPHI STUDY CONDUCTED AMONG JUDICIAL MEDICAL OFFICERS IN SRI LANKA

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INTRODUCTION

In Sri Lanka and other South Asian countries, much of the medico-legal work is done by government medical officers who do not have a post-graduate qualification in forensic medicine. No matter what branch of medicine or surgery the graduate enters he will always have to face medico legal problems. If he is in general practice these may occur daily. Sometimes when a doctor evaluates a patient with a violence-related injury, whether it is at the emergency care unit, surgical unit or any other unit, it is unknown whether the case will have a medico legal outcome. Some of these patients have injuries or conditions that have criminal or civil forensic medical implications and the prospect of courtroom sequelae. It has been observed that many practicing doctors are not very confident about performing routine medico-legal duties. Those medical officers not trained in the area of medico legal work have insufficient experience of such work which results in destroying, throwing away or losing pertinent evidence, illegible records, partial documentation, or incomplete medical records, delayed forensic examination, missing subtle injuries because of lack of pattern recognition and making "educated guesses" about the mechanism of injury which all result in the medical evidence not being properly presented in court (Wiler & Bailey, 2007).

Undergraduate curricula cannot include all aspects of a specialty and the criteria for including content into the undergraduate curricula should not be based purely on the enthusiasm of teachers. Medical curricula should be focused on outcomes and supported by a strong foundation of educational theory and research. It is therefore necessary to develop an evidence based approach to making decisions on the content that is to be included in undergraduate curricula. It is expected that such interventions will improve education and help learners achieve the competencies pertinent to their profession (Thomas P, 1999).

OBJECTIVE

To identify competencies expected from a medical officer in performing medico legal duties

METHOD

The Delphi technique was employed to identify competencies that are expected from a medical officer in performing medico-legal duties (Brown et al., 2006 ; Brown et al., 2005).

This included the following stages

(1) Designing the first round questionnaire

A questionnaire was designed to include statements that have been identified from the following sources, as medico-legal duties of 'medical officers'[1];

1. Circulars of the ministry of health: Medico-legal duties of medical officers in the ministry of health Sri Lanka as

documented in the Manual of management of District Hospitals, Peripheral units and Rural hospitals and the Manual of management of provincial hospitals, 1995[2]

2. National benchmarked consensus standards 2004[3]
3. The criminal procedure code[4]
4. The evidence ordinance[5]
5. Literature review (Harden and Dent, 2005, Schwarz and Wojtczak, 2002, Simpson et al., 2002).

These statements were collated into a single list. Statements in the list were grouped and assessed for similarity, and similar attributes were amalgamated and grouped into 09 broad educational outcome domains. Each competence was accompanied by a five point competency category scale; Definitely not important (1), Probably not important (2), Undecided (3), Probably important (4), Essential (5).

A pilot study was undertaken and changes were made to the original questionnaire based on the feedback.

(2) Selection of "expert panel"

The "expert panel" consisted of those who satisfied the following selection criteria.

1. Successful completion of the MD in Forensic Medicine **OR**
2. Board certified in forensic medicine, in the absence of an MD
3. Agreement to be a part of the expert panel

(3) First round of the Delphi survey

The modified questionnaire was distributed by electronic and postal mail to 52 "experts" who consented to participate. They were requested to define the standards required by a medical officer in performing medico-legal duties, to be judged competent. The respondents were encouraged to rate each competency according to the five point competency category scale. The respondents were also prompted to add any other competencies that they felt were necessary or remove any items they felt inappropriate or unnecessary, and provide any further comments. Information on the number of years of judicial medical service, approximate number of autopsies conducted and the approximate number of clinical medico-legal cases examined were also accessed via the questionnaire.

The responses were anonymous. The questionnaires were coded to ensure that non-responders could be contacted and to ensure that the feedback from the first round questionnaire could be given accurately via the second round questionnaire. Subsequent written, email and personal telephone reminders were made to the non-responders after 4 weeks.

The ratings given by the respondents in the first round were summarized by calculating percentages for each statement from the total responses to the questionnaire.

Free text comments were assessed for any common recurring themes.

(4) Second round of the Delphi survey

The second round questionnaire was created by excluding statements which received 80% or more for the competency category 5 (essential). The remaining statements were included with information of the percentage response to the categories definitely not important, undecided and essential, for each statement together with a reminder of the respondents own previous score. The second round questionnaire was re-circulated among the experts who responded to the first round questionnaire, by electronic and postal mail. Each expert was asked to study the group response and indicate whether their individual opinion remained unchanged or should be modified in the light of the responses made by the other members of the panel. Further modifications or additions to the statements were not sought.

Subsequent written, email and personal telephone reminders were made to the non-responders after 4 weeks.

The responses to the statements in the second round were compared with the first round responses. The percentages were calculated for each statement in each category considering the cumulative response in both rounds. The percentage change in response was calculated for each statement.

DEFINING CONSENSUS

In order to distinguish the more important statements a *group agreement* was defined as, if the statement under consideration received a total agreement of >= 80% in the essential category in the first Delphi round.

The *net change* in agreement between Delphi rounds will be used as a measure of the *level of agreement* between the panel members. *Group consensus* was defined as total agreement >=80% in the essential category after the second Delphi round with a net change of less than +/-10%.

If both these parameters *(group agreement* and g*roup consensus)* are satisfied, *group consensus agreement* will be established and the statement will be defined as an essential competence for medico-legal practice (Brown et al., 2005).

VALIDATION

A committee forum was conducted with a validation sample of 4 experts who were requested to provide their views upon the list of competencies identified as "essential", subsequent to the 2 postal rounds.

RESULTS

Essential competencies for medico-legal practice

Twenty five questionnaires were received (response rate 69.5%).

Demographic data of the experts

One Judicial Medical Officer had not responded to the demographic details requested.

Mean number of yrs in judicial medical service 14.5 yrs.

Mean number of autopsies conducted 2790

Mean number of clinical medico-legal cases examined 10,481

Table 6

Statements which received group consensus agreement as essential competencies

Develop clinical skills		**Definitely not important**	**Probably not important**	**Undecided**	**Probably important**	**Essential**	**Change**
1.1	Take a history, for medico-legal purposes, using a thorough approach	0	0	0	4 (11)	32 (89)	
1.2	Physically examine patients, for medico-legal purposes, in a thorough and sensitive manner	0	0	0	1 (3)	35 (97)	
1.3	Observe clinical phenomena accurately	0	0	0	4 (11)	32 (89)	
1.4	Refer relevant cases for inquests	1 (3)	1 (3)	0	5 (14)	29 (81)	
1.5	Identify a judicial from a pathological post mortem	0	1 (3)	1 (3)	2 (6)	31 (86)	

1.6	Conduct an autopsy using routine dissection procedures	0	1 (3)	0	1 (3)	34 (94)	
1.7	Conduct an autopsy using special dissection procedures	0	1 (3)	0	5 (14)	30 (83)	
1.8	Observe autopsy phenomena accurately	0	0	0	1 (4)	34 (94)	
1.9	Differentiate postmortem changes from ante mortem phenomena	0	0	0	2 (6)	34 (94)	
1.10	Estimate time since death	0	0	1 (3)	4 (11)	31 (86)	
1.11	Determine the cause of death	0	0	0	0	36 (100)	
1.12	Identify abnormalities in the body that occur due to trauma	0	0	0	0	36 (100)	
1.13	Describe injuries for medico-legal purposes	0	0	0	2 (6)	34 (94)	
1.14	Interpret injuries and injury patterns for medico-legal purposes	0	0	0	1 (3)	35 (97)	
1.15	Understand the etiology and natural history of diseases	0	0	2 (6)	4 (11)	30 (83)	
1.16	Investigate a sudden natural death	0	0	0	5 (14)	31 (86)	
1.17	Identify the possible cause for a negative autopsy	0	0	0	4 (11)	32 (89)	
1.18	Identify the living and the dead for medico-legal purposes	0	0	1 (3)	2 (6)	33 (92)	
1.19	Investigate a case of suspected criminal abortion for medico-legal purposes	0	0	1 (3)	3 (8)	31 (86)	
1.20	Investigate asphyxial deaths for medico-legal purposes	0	0	0	2 (6)	34 (94)	
1.21	Investigate a scene of crime	1 (3)	1 (3)	0	4 (11)	30 (83)	
1.22	Investigate a mass disaster	1 (3)	1 (3)	1 (3)	4 (11)	29 (81)	
1.23	Perform an exhumation/excavation	2 (6)	0	1 (3)	3 (8)	30 (83	
1.24	Investigate a case of poisoning for medico-legal purposes	0	0	0	2 (6)	34 (94)	
1.25	Investigate a case of drunkenness/substance abuse	0	0	1 (3)	1 (3)	34 (94)	
1.26	Justify the selection of appropriate investigations	0	0	2 (6)	4 (11)	30 (83)	
1.27	Identify abnormal human behavior	0	0	1 (3)	5 (14)	29 (81)	+2 (6)
1.28	Diagnose and certify death	2 (6)	0	0	5 (14)	29 (81)	+2 (6)
1.29	Document the cause of death according to the WHO format	0	0	0	5 (14)	31 (86)	+3 (8)
1.30	Identify abnormalities in body structure/ function	0	0	0	4 (11)	30 (83)	+2 (6)

Demonstrate an analytical approach and evidence based attitude in professional activities							
2.1	Analyze and interpret findings in order to solve problems	0	0	0	3 (8)	31 (86)	
2.2	Work with awareness of the power and limitations of scientific thinking	0	0	0	5 (14)	29 (81)	+2 (6)
2.3	Work with awareness of complexity, uncertainty and probability in decisions in medico-legal practice	0	0	0	4 (11)	30 (83)	+3 (8)
2.4	Determine the scientific basis for clinical and autopsy findings	0	0	0	2 (6)	32 (89)	
Work efficiently within the medico-legal framework and laws related to medical practice							
3.1	Work with awareness of how the medico-legal system is organized	0	0	0	5 (14)	30 (83)	
3.2	Utilize facilities/services related to medico-legal practice appropriately	0	0	0	2 (6)	33 (92)	
3.3	Demonstrate knowledge of laws applicable to medical practice	0	0	1 (3)	4 (11)	30 (83)	+2 (6)
3.4	Maintain chain of custody in communicating with relevant institutions	0	0	0	0	35 (97)	
3.5	Maintain confidentiality in communicating with relevant institutions	0	0	0	1 (3)	34 (94)	
Communicate effectively and sensitively							
4.1	Communicate with patients in a sensitive manner	0	1 (3)	0	3 (8)	31 (86)	
4.2	Communicate appropriately in difficult circumstances such as breaking bad news and discussing sensitive issues	0	0	0	5 (14)	30 (83)	+2 (6)
4.3	Communicate effectively with court	0	1 (3)	0	1 (3)	33 (92)	
4.4	Communicate effectively with colleagues, police, lawyers, community and other sectors	0	0	0	3 (8)	32 (89)	
Practice medicine ethically and in accordance with the standards set by the Sri Lanka Medical Council							
5.1	Handle patients and their relatives in an ethical manner	0	0	0	1 (3)	34 (94)	
5.2	Recognize the rights of people	0	0	0	1 (3)	34 (94)	
5.3	Identify what amounts to medical negligence and the defenses available to the practitioner against a charge of medical negligence	0	0	0	4 (11)	30 (83)	
Handle vulnerable groups effectively (elder abuse, child abuse, infanticide, SIDS, domestic violence, violence in custody)							
6.1	Identify signs that suggest abuse/neglect	0	0	0	1 (3)	35 (97)	
6.2	Investigate a suspected case of abuse/neglect	0	0	0	2 (6)	34 (94)	

6.3	Know what action to take to safeguard the welfare of the abused/ neglected	0	0	0	6 (17)	30 (83)	
6.4	Investigate a victim alleging sexual abuse for medico-legal purposes	0	0	0	1 (3)	35 (97)	
Maintain accurate, legible and complete medical records							
7.1	Maintain records of relevant communications with patients/relatives, colleagues and courts	0	0	1 (3)	4 (11)	31 (86)	
7.2	Record data and observations accurately, legibly in the relevant documents	0	0	0	1 (3)	35 (97)	
7.3	Synthesize and present information appropriate to the needs of the audience	0	0	1 (3)	5 (14)	30 (83)	+2 (6)
7.4	Ensure safety of documents	0	0	0	1 (3)	35 (97)	
7.5	Ensure easy and quick access to records	0	0	0	4 (11)	32 (89)	
Ensure personal development							
8.1	Develop professional values like responsibility, honesty and commitment to scientific methods	0	0	0	0	36 (100)	
8.2	Seek out information rather than to wait for it to be given	0	0	0	6 (17)	30 (83)	+3 (8)
8.3	Recognize one's own personal and professional limits and seek help	0	0	1 (3)	5 (14)	30 (83)	
8.4	Recognize the need for continuous self-improvement	0	0	1 (3)	3 (8)	32 (89)	
8.5	Resolve conflicts in a professional manner	0	0	0	5 (14)	31 (86)	
Contribute to the development of the specialty of forensic medicine and the medico-legal system							
9.1	Demonstrate basic skills and positive attitudes towards teaching	1 (3)	1 (3)	0	4 (11)	30 (83)	+3 (8)
9.2	Ensure the safety of health care workers working in your team	0	0	0	5 (14)	31 (86)	

Opinion of the validation sample

The validation sample confirmed the above competencies as essential.

Table 8

The responses to outcome categories in round 1 (R1) and round 2 (R2)

Outcome	No. of competencies in R1	No. (%) of items considered as essential in R1	No. of items considered as essential in R1 & R2
Develop clinical skills	33	26 (79)	30 (91)
Demonstrate an analytical approach and evidence based attitude in professional activities	9	2 (22)	4 (44)
Work efficiently within the medico-legal framework and laws related to medical practice	5	4 (80)	5 (100)

Communicate effectively and sensitively	7	3 (43)	4 (57)
Practice medicine ethically and in accordance with the standards set by the Sri Lanka Medical Council	3	3 (100)	3 (100)
Handle vulnerable groups effectively (elder abuse, child abuse, infanticide, SIDS, domestic violence, violence in custody)	6	4 (67)	4 (67)
Maintain accurate, legible and complete medical records	5	4 (80)	5 (100)
Ensure personal development	9	4 (44)	5 (56)
Contribute to the development of the specialty of Forensic Medicine and the medico-legal system	4	1 (25)	2 (50)

INFERENCE

There is more emphasis on outcome categories of clinical skills, medical law, ethics and maintaining records while there was less emphasis on critical thinking, communication, handling vulnerable groups, ensuring personal development and contributing to the development of the specialty.

DISCUSSION

This research established specific, expert derived, evidence and competency based learning outcomes for medico-legal practice. The fact that information was accessed, in this study, from a number of sources and techniques (identifying critical elements of behaviour via accessing expert judgement, identifying medico-legal needs needs based on circulars issued by the ministry of health, the benchmark statement of the university grants commission, the criminal procedure code and the evidence ordinance) and the fact that information was gathered systematically makes the data more valuable and useful than random impressions.

It is accepted that the qualifications and experience of an expert may give credibility to the services provided by that expert. However it is seen that in routine medico-legal issues the same degree of expertise is expected from a generalist as from a specialist. Therefore in the process of identification of competencies required for medico-legal practice, this study did not differentiate between the competencies required by specialists and generalist but on the identification of competencies needed for 'medico-legal practice' in general.

A modified version of the Delphi technique was used in the present study, for accessing expert judgement where the first round questionnaire itself was structured with a few open ended questions. Even though a questionnaire with open ended questions would have increased the richness of the data this hybrid method was preferred to strike a balance between representativeness and accuracy. The validity and reliability of the questionnaire was improved by utilising multiple sources (circulars of the ministry of health, the ministry of higher education, the ministry of justice, other literature) for its construction and pilot testing the questionnaire. The fact that there were no sufficiently frequent themes in the free response section to justify modification of the second round questionnaire and the fact that comments made merely endorsed what was already included reflects the satisfaction of the experts with the questionnaire and provides further corroboration of the accuracy and validity of the items included.

In spite of the fact that there is greater generation of data as the number of participant's increases, there is very little actual empirical evidence on the effect of the number of participants on the reliability or validity of consensus processes. Inclusion of a limited number of participants (since there are a limited number of specialists satisfying the criteria for inclusion in Sri Lanka) for this study maybe justified by the fact that

representativeness in Delphi studies is assessed on the qualities of the expert panel rather than its numbers (Hasson et al., 2000). Since the respondents of this study (the experts) consisted of those attached to the ministry of health (consultant judicial medical officers) as well as those attached to the ministry of higher education (university teachers) and had significant experience in medico-legal work (a mean of 14.5 years of service in medico-legal work with a mean number of medico-legal cases examined being 10,480 and a mean number of autopsies conducted 2790) indicates that they are broadly representative of those suitable to identify competencies.

Even though there are no firm rules for determining when consensus is reached in Delphi studies, the level at which panel agreement became consensus was considered carefully in this study. This study utilised the concept of empiricism. Initially a cut off level of 90% was considered and a short workable list of competencies was identified. However this resulted in exclusion of some competencies that were considered important in medico-legal practice (eg., the entire outcome category of; "Demonstrate an analytical approach and evidence based attitude in professional activities"). Therefore the researcher considered a more inclusive set of competencies using 80% as a cut off. This resulted in a longer but workable set of competencies. Even though empiricism is considered to introduce a degree of subjectivity to the result the researcher attempted to minimise this by introducing strict inclusion criteria in selecting the panel and monitoring the attrition rates to ensure that the range of expert opinion is adequately represented in successive rounds and that response bias is reduced.

However, even though successive rounds show an improvement in the numerical strength of consensus, it is unclear whether this actually reflects the accuracy of the group's decision making (Greatorex and Dexter, 2000). The possibility of the "Halo effect" "majority opinion" or 'Social desirability bias' where the panellists may be persuaded to conform rather than express true agreement and 'tactical voting' where the group tries to swing the conformists towards their opinion in later rounds was acknowledged (Yeates, 2010). However the issue of this potential bias was minimised in the interpretation of data by excluding statements with a *net change* in agreement between Delphi rounds of more than +/-10% (3 out of 30). (Greatorex and Dexter, 2000) The fact that the net change in opinion is within +/-10% for a majority (27 out of 30) of competencies enhances the validity of the results of this study. The reason for lower level of agreement (higher net change) of the competencies "Use communication and information technology to assist in the administration of justice", "Understand the application and limitations of information technology" and "Conduct medical research with knowledge of the ethical principles" may be the lack of insight of the more senior experts into the importance of information technology and research in medico-legal practice. The effect of the 'social desirability bias' too cannot be excluded. The conduct of a committee forum with a validation sample added strength to the results of this study.

The response rate in this study was moderate. Even though Greatorex and Dexter (2000) identified disagreeing with the design and content of the study and lack of faith in the initial results as reasons for high attrition rates, the fact that a pilot study was conducted, there was no criticism regarding the design and content of the study in the free response section and the fact that diversity of opinion was low between the two rounds indicate that this is not the case. The possible reasons for attrition in this study maybe participant fatigue and low motivation. Attrition was influenced in this study by limiting the number of questionnaire rounds to two, by following up the non-respondents closely and by removing statements with a response of over 80% in the first round in order to avoid duplication resulting in panel fatigue in the second round. This study addressed the issue of a moderate response

rate (69.2%) by the inclusion of a validation sample of respondents who were requested to provide their views upon the series of statements already identified by the experts (Broomfield and Humphris, 2001). The consensus between the two groups of respondents gave some reassurance about the efficacy of the study.

When considering identification of the importance of outcome categories by the experts several interesting findings were revealed. Ethics scored highly with all its competencies being identified by the experts as essential in the first round itself. Clinical skills, maintaining records, and medical law followed closely with all the competencies in the latter two categories being accepted in the second round. However areas such as analytical approach, communication skills, personal development and contributing to the development of the speciality scored low in the list. A significant proportion of the competencies in the outcome categories analytical approach (55.6%), communication skills (42.9%), handling vulnerable groups (33.3%), personal development (44.4%) and contributing to the development of the speciality (50%) were considered "non-essential". This is probably due to a number of reasons. Firstly, the group consisted mainly of "clinicians" with an active service component but with minimum teaching and research experience. Second, the traditional nature of the curricular which the experts themselves have experienced and finally a background culture of more traditional legal practice which they are exposed to where the doctors' conduct and opinion as an expert witness was hardly challenged due to the respect for the doctor and the lack of medical background of the lawyers. However, since all the panellists, fulfil strict expert selection criteria, it is important to consider the responses of the expert group as a whole to ensure an appropriate balance of opinion and therefore an objective conclusion. Certainly there would be many in the medical education community who would strongly support the inclusion of some of the rejected competencies (eg., competencies related to outcome "Demonstrate an analytical approach and evidence based attitude on professional activities"). It is important to note at this stage that even though there were 19 competencies identified as "non-essential" by experts a significant proportion (25%) considered them as "probably important" with little diversity of opinion within the expert group (the % change between the 2 rounds is more than 10 in only 3 competencies). This acknowledges the fact that these competencies have been considered as important' but not 'essential'.

CONCLUSION

The standards that are required by an expert medical witness to be judged competent, in Sri Lanka, have been established. This would provide an evidence base to determine what needs to be included in undergraduate medico legal curricula. A similar methodology maybe adopted when identifying what needs to be included in curricula of other disciplines.

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