Competence and Performance: Two Different Concepts in the Assessment of Quality of Medical Care

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In the debate about 'what is a competent general practitioner?' little attention has been paid to the actual practice situation of general practitioners. This paper, based on the 18 most important studies in the literature about medical competence, tries to re-initiate this debate by proposing a clear distinction between 'competence', (what a physician is capable of doing) and 'performance' (what a physician does in his day-to-day practice). With this distinction we looked at whether studies defined both competence and performance, how they dealt with these concepts, what measurement instruments were used and what the conclusions of the studies were. Although it is the common reasoning that competence is a good predictor of performance this concept could not be affirmed. This survey shows that the majority of studies use wrong concepts and come to invalid conclusions. With the empirical distinction between competence and performance however, this paper proposes new directions for the quality assessment of general practitioners.

The British government's white paper on primary health care has again raised the debate about the quality of care delivered by general practitioners. In this report indicators are mentioned in relation to high quality, such as personal availability, preventive activities, attendance at postgraduate courses and certification procedures. Also, a recent series in the British Medical Journal, 'What is a good GP?', poses several questions regarding the criteria against which general practitioners should be measured. The discussion is closely related to the issue 'What is a competent doctor?', 'standard measurements of quality' and to assessment procedures in general practice.

What is a competent doctor? Many authors and organizations in areas of medical research and medical education have struggled with this question. With the introduction of standards and logical branching flow charts in medical practice the debate about 'what is competence', 'what is good', and 'what is quality' is also of current interest in this area. The relevant literature includes a large vocabulary, e.g.: ability, behaviour, performance, clinical judgment, clinical reasoning, habitual performance, problem-solving, clinical competence and the combination of knowledge, skills and attitudes.

The fundamental problem of this lack of clarity about competence is that each author means different things when using the word 'competence'. Other authors deal with the same issue but use different names. The use of different instruments to measure competence, for instance 'paper and pencil tests', 'chart audit', and 'simulated patients', complicates the issue further.

This paper intends to give a clearer picture of 'competence' and specifically proposes clear distinction between it and 'performance'. The reason for doing so is because we think that the debate about the quality of medical care will gain in clarity if this distinction is used. After making the distinction between 'competence' and 'performance' this will be applied to a synthesis of the literature examined from several viewpoints: to see if studies define both competence and performance, how the studies deal with these concepts, what measurement instruments were used and finally the conclusions of the study. Details of the psychometric characteristics of different measurement instruments are presented.
The distinction between competence and performance

Quality of care is the crux of every health care system. In trying to guarantee this quality licensure boards have set up examination systems for medical students, who on passing change from a potential to a real doctor. The reasoning underlying these examinations is that passing them predicts the performance of a doctor in the period after the medical school. In other words passing the examinations predicts quality of care.

Senior and Lloyd distinguished between 'competence' and 'performance'; the former meaning 'what a physician is capable of doing' and the latter 'what a physician actually does in his day-to-day practice'. These definitions clearly demarcate the examination: before and during the examination the candidate must behave to the best of his abilities; he deals with the competence setting. After passing the doctor deals with normal day-to-day situations and attempts to cope with them; he deals with the performance setting.

One might argue that 'competence' is made up of several aspects and that it would be more appropriate to speak of 'competences', referring to competences as a series of parameters such as diagnostic and therapeutic skills, interpersonal skills, etc. In this paper however we want to emphasize the construct of competence as a single entity. With the measurement of competence (or performance) both concepts indeed can be operationalized into several aspects.

The distinction between competence and performance raises the question of their relationship. In this there are two possible approaches.

The first one, a more psychometrical approach, considers competence as the limit of one's performance. Or, stated differently, performance is an indicator of competence and vice versa; performance can be observed whereas competence can only be inferred. In this concept competence and performance are not two separate concepts but are separate measurement points of the same concept. An example of this reasoning is the current examination system: passing predicts performance.

In the second approach competence and performance are considered as two separate concepts although they can be related in a very delicate way. This approach takes more account of the actual practice experiences of general practitioners. When treating patients doctors are influenced by motivational and situational variables. This situation is completely different from their examination situation.

The first reasoning is the one that most educationalists have followed and is the basis of all existing examination systems.

Whether competence is indeed a good predictor of performance has been studied in eight of the eighteen studies mentioned in Table 1 (studies 1–6, 9 and 10); all but one fail to establish this relationship. Only Peterson concludes that years of experience is an indicator of competence (Study 3). With these results at hand researchers conclude that their measurement instruments are not good enough. They conclude that the reason for not establishing a relationship between competence and performance is a psychometric problem.

As in the past 10 years there is only one direction in which this educational research line will go: to construct more and refined measurement instruments which try to assess competence as closely as possible.

The second reasoning, to consider competence and performance as two different concepts, could be more fruitful. If it could be proved that we have to consider competence and performance as different concepts this could give new impulses for research into the daily work of physicians. More research could be focused then to the diagnostic pathways which doctors use during contacts with real patients and which most times do not seem to be very logical or fail to reach ideal standards.

In order to explore this second reasoning the aforementioned 18 studies are reviewed to look at how authors dealt with competence and performance. We will adopt the definitions of competence and performance by Senior and Lloyd and apply these to the literature.

Definitions

Only three of the studies in Table 1, give an explicit definition of either competence or performance or both (12, 13 and 16). Fabb states that 'competence is to assess performance' (13), while Morgan sees a competence level as necessary for adequate performance (12). Only Neufeld explicitly separates both concepts in their definitions using the same theoretical concepts as we do in this paper (16). The 15 other studies do not define competence or performance other than in terms of a measurement instrument. Careful examination of these 15 studies, however, shows that most authors implicitly use different concepts of performance and/or competence.

Because of this implicit use of concepts the assessment of these concepts had to be done in two steps. First we looked how the authors used the terms performance/competence and whether they separated both words or used them alternatively. Only one of the 15 studies implies the competence concept (3). Of the 14 other papers eight use the performance concept only (4, 5, 7, 8, 14, 15, 17, 18). Six papers use both concepts synonymously (1, 2, 6, 9–11). (Table 1, subheadings 4–6).

In the second part of this assessment our definitions of performance and competence were applied to all the studies to see whether these were in accordance with

Instruments will not be examined. Finally this paper indicates directions in which assessment of the quality of care delivered by general practitioners might go. This paper is not intended as a quantitative review of the quality of care literature but it takes account of the 18 important studies on this subject (Table 1).
### Table 1 The discussed studies

<table>
<thead>
<tr>
<th>Study Ref.</th>
<th>Title</th>
<th>Journal/Year</th>
<th>Notes</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>1. Purposes of study</th>
<th>To determine the format of the examination of medical candidates</th>
<th>To determine an index of competence</th>
<th>To describe the state of the art</th>
<th>To measure knowledge and to compare that with actual treatment</th>
<th>To investigate the dimensions of performance and how they have been measured</th>
<th>To see if there is a relation between the score of pass/fail students and their career</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Definition of competence</td>
<td>no (see aspects)</td>
<td>no</td>
<td>no</td>
<td>nc</td>
<td>no (see aspects)</td>
<td>no</td>
</tr>
<tr>
<td>3. Definition of performance</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>nc</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>4. Implicit use of competence</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>5. Implicit use of performance</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>6. Implicit use of comp/perf alternating according to senior</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>7. Use of competence according to senior</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>8. Use of performance according to senior</td>
<td>no</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>9. Use of comp/perf alternating according to senior</td>
<td>no</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>10. Indicators of comp/perf</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>11. Discussed aspects of competence</td>
<td>Years of experience is an indicator of competence</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>12. Measurement instruments</td>
<td>Two separate components of efficiency measured from doctors' performance; proficiency measured from the results of this performance in a patient</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>13. Standards discussed</td>
<td>External criteria by experts (all N=232&lt;60%)</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>14. Results/conclusions of the study</td>
<td>Findings illustrate varied and indistinguishable levels of performance quality of docs, irrespective of specialty and certification. There is a negative correlation between performance and years of experience. Diagnostic proficiency decreases; efficiency stays equal</td>
<td>Probability of competence increases with amount of training. Most neglected aspect of continuing competence is volume of experience. Measured academic ability has no relation with competence</td>
<td>Performance on MC is not predictive of performance in actual care. It is not a matter of correcting deficiency of knowledge but of translating knowledge into action</td>
<td>At present there exists no system for measuring the overall performance of doctors that has been validated in the sense that those who measure higher have been shown to produce better patient outcome</td>
<td>There is no correlation between grades and career. Actual behaviour is different from ideal behaviour</td>
<td>–</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>1. <strong>Purposes of study</strong></th>
<th>To see if the recorded process of medical care and outcome are related</th>
<th>To describe competence in medical education</th>
<th>To test criterion validity of PMP by direct comparison with actual practice</th>
<th>To compare performance of students on PMP and on SP</th>
<th>To improve procedures for evaluating students performances in hospitals laboratory and health care clinics</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. <strong>Definition of competence</strong></td>
<td>no</td>
<td>no (see aspects)</td>
<td>no</td>
<td>no</td>
<td>The knowledge and skills that are necessary for adequate performance in the profession</td>
</tr>
<tr>
<td>3. <strong>Definition of performance</strong></td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>Naturalistic behaviour</td>
</tr>
<tr>
<td>4. <strong>Implicit use of competence</strong></td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td></td>
</tr>
<tr>
<td>5. <strong>Implicit use of performance</strong></td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td></td>
</tr>
<tr>
<td>6. <strong>Implicit use of comp/perf alternating</strong></td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>7. <strong>Use of competence according to senior</strong></td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td></td>
</tr>
<tr>
<td>8. <strong>Use of performance according to senior</strong></td>
<td>yes</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>9. <strong>Use of comp/perf according to senior</strong></td>
<td>yes</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>10. <strong>Indicators of comp/perf</strong></td>
<td>no</td>
<td>Performance on PMP must be performance in real practice</td>
<td>Naturalistic behaviour versus Performance test</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>12. <strong>Measurement Instruments</strong></td>
<td>Chart audit</td>
<td>Chart audit</td>
<td>Chart audit</td>
<td>Chart audit</td>
<td>Chart audit</td>
</tr>
<tr>
<td>13. <strong>Standards discussed</strong></td>
<td>Chart audit</td>
<td>Predetermined criteria for optimal care, by experts</td>
<td>Chart audit</td>
<td>Chart audit</td>
<td>Chart audit</td>
</tr>
<tr>
<td>14. <strong>Results/Conclusions of the study</strong></td>
<td>Correlation between good medical care and recording is + .23</td>
<td>Definition of competence is bound to local, political, social, economic circumstances, to health needs, resources and structure of health system</td>
<td>The PMP is a good predictor of what will not be done in actual practice</td>
<td>The PMP has a large, significant effect on the number of options selected</td>
<td>There is a difference between a performance-test and habitual behaviour</td>
</tr>
</tbody>
</table>

### 1. Purposes of study
To make an examination handbook which described methods in current use for measuring competence in general practice.

### 2. Definition of competence
To measure competence is to measure performance by assessing behaviour in knowledge, skills, attitudes.

### 3. Definition of performance
- No
- No
- Refer to Senior

### 4. Implicit use of performance
- No
- No
- Refer to Senior

### 5. Implicit use of competence
- Yes
- Yes
- Yes

### 6. Implicit use of comp/perf alternating
- Yes
- No
- Yes

### 7. Use of competence according to senior
- No
- Yes
- No

### 8. Use of performance according to senior
- No
- Yes
- No

### 9. Use of comp/perf alternating according to senior
- Yes
- No
- No

### 10. Indicators of comp/perf
- Yes
- No
- No

### 11. Aspects of competence
1. Understanding the individual, family & community
2. Analyzes and defining health problems
3. Managing health problems
4. Preventive approach to health care
5. Accepting responsibility as a doctor

### 12. Measurement Instruments
- Physichian interview; Patient interview; Videotaped consultation; Chart audit
- All methods

### 13. Standards discussed
- Use of criteria maps. Only 50% is met

### 14. Results/conclusions of the study
Test selection should be Essay 6%; Case 6%; MC 12%; Clinical interpretation 10%; PMP 16%; Diagnostic interview 24%; Physical examination 10%

|------------------|----------------------|------------------------|----------------------|----------------------|----------------------|
This paper shows that research workers do not specify or labelled their instruments incorrectly. In these five necessary. However because every author use difference they mean. One might argue that authors do not very carefully which concept of competence/perform-
ance, oral examination, multiple choice questions. DISCUSSION

Use of measurement instruments
Inherently related to the use of competence/performance concept is the use of measurement instruments. It is argued here that the distinction between competence and performance has its implications for the use of measurement instruments. If the object of study (competence, performance) and used measurement instrument do not match, then research conclusions are invalidated.

Measurement instruments (or methods) can be divided into direct and indirect methods. With direct methods the research workers see or hear a physician dealing with patients or with examiners. Such methods include observation of doctors (both video and audio), use of standardized patients or oral examinations. With indirect methods direct observation of doctor-patient contacts is not possible. They depend upon written simulation papers, chart audits, interviews and multiple choice questions. Using the concepts of competence and performance it is clear that some instruments may be used in both concepts, while others may not. Written simulation papers, laboratory observation, oral examination, multiple choice questions can only be used in the competence-situation. Chart audit can be used for performance measurement. One of the best methods for performance measurement (high reliability and validity) is some kind of unobtrusive measurement such as the use of standardized patients in a blinded way, so that doctors do not know when they are dealing with such a patient. We analysed 16 of the 18 studies (3 and 6 are review papers) to see whether the appropriate measurement instrument had been used. For example if an author used a written simulation method and yet labelled the study as measuring performance this is considered incorrect. Five (31%) used incorrect instruments (2, 5, 9, 14, 17) or labelled their instruments incorrectly. In these five studies the authors' purposes were to describe performance, but instead they measured competence.

DISCUSSION
This paper shows that research workers do not specify very carefully which concept of competence/performance they mean. One might argue that authors do not give definitions because it is neither important nor necessary. However because every author use different concepts implicitly, a definition is imperative and enables the reader to interpret the situation he is dealing with.

The comparison between the authors' implicit definitions of performance/competence and the way we classified these according to our concepts revealed a disturbing picture. It is disappointing that so many papers fail to delineate what they are dealing with and it is even more disturbing that most authors deal with concepts which they label incorrectly. The consequence of this misclassification is also shown in the use of measurement instruments: Even among the 11 studies in which the right instruments were used four authors interpreted their own concept falsely (1, 4, 10, 11). This means that in only seven (44%) studies (7, 8, 12, 13, 15, 16, 18) the right instrument matched the right concept!

We are inclined to consider only the conclusions of these seven studies as valid. Fessel (7) and Lyons (8) conclude that they did not find a significant relation between chart audit and good medical care. Fabb (13) and Neufeld (16) give a framework for a test to measure competence. The other studies, Morgan (13), and Sanazaro (15) and Norman (18), refer to a possible distinction between competence and performance. This is in line with our reasoning. It is clear that the majority of studies adhere to the reasoning that competence is an indicator of performance. But, as we stated earlier, all but one failed to establish this relationship.

To develop a better empirical basis for the debate about the quality of medical care future studies should concentrate on the difference or relation between competence and performance. The implication of the results of these future studies might have great impact both on medical schools and medical practice. Will it still be justified to teach medical candidates 'competence', or should medical schools concentrate more on 'performance'? Sibley, in a study to determine the effects of continuing medical education, concluded that although the participants showed significant gains in their knowledge, they did not change in their performance. 6 Norman showed that doctors in actual practice performed considerably below the criteria developed by themselves. 7 Should standards of quality of medical care, delivered by doctors in their daily practice, continually be used based on 'competence' standards?

To find an answer to these questions we think the recommendations are essential. Firstly, researchers should make a clear distinction between 'competence' and 'performance'. We think this could be done according to our definitions. Secondly when using measurement instruments research workers should choose their instrument in correspondence with the object of study. In general it can be stated that different concepts require different measurement instruments. For those instruments which seem appropriate for both competence and performance settings researchers
should carefully describe in which setting they are used during the study. At present we are running a study in which we try to find more empirical evidence for the distinction between competence and performance. We compare general practitioners in three settings. In the first setting doctors will be visited by standardized patient, indistinguishable from real patients. In the second setting the same doctors will deal with the same standardized patients in a laboratory situation (video controlled). Finally the doctors will handle a written simulation about the same patients as they met before.

Other research questions in this area are whether a relation between performance and output of medical care exists. What factors influence the performance of doctors and how may they be influenced to raise the standards of performance?

It is our conviction that the debate about the quality of medical care can take place at a higher level if these fundamental questions are answered clearly.

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REFERENCES
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