

Summary

SUMMARY

Medical students and residents learn in specific contexts. These contexts constitute their clinical learning climates, which are generally regarded as an important indicator of the educational quality of a department that provides clinical training. The clinical learning climate is the subject of this thesis.

The setting of the studies in this thesis is the clinical phase of undergraduate medical training, also referred to as clerkships, and postgraduate specialist training in the Netherlands. In this thesis postgraduate trainees at all levels of training are referred to as residents.

To provide some insight into what is already known about learning climates, **Chapter 1** summarises the organisational psychology literature and the medical education literature on (learning) climates.

Within the *organisational psychology literature* the study of organisational climates started more than half a century ago. The most frequently used methodology is questionnaires for quantitative comparisons between organisations. Less attention is given to defining the organisational climate. Later, organisational culture researchers focus on the study of individual organisations as opposed to the comparative studies favoured by researchers of the organisational climate. Culture researchers predominantly employ observational and anthropological methodologies. The last decade these two research groups have tended to integrate and incorporate ideas and research methodologies from each other.

The *medical education literature* comprises multiple studies of the educational climate in medical schools. Most studies describe instruments to evaluate the learning climate or use these instruments to compare between different groups. The psychometric properties of instruments are only rarely described and this impedes evaluation of the instruments' psychometric quality. A clear definition of the learning climate is lacking. In addition, several authors have published qualitative studies on this subject.

Despite the abundance of studies on the concept of (clinical) learning climates, it remains to be explored what this climate is and which factors play a part. This thesis aims to answer the following research questions: What elements play a part in the clinical learning climate? How can it be measured? What is the clinical learning climate? And how can it be defined?

Chapter 2 describes the psychometric properties of an existing instrument: the Postgraduate Hospital Educational Environment Measure (PHEEM). The instrument is relevant for this thesis because it is specifically designed to measure the clinical learning climate. The 40-item questionnaire consists of items such as feedback, atmosphere and facilities. The original designers of the questionnaire identified three sub-scales: perception of autonomy, perception of teaching, and perception of social support, but failed to test PHEEM's *construct validity* (the agreement between the hypothesised sub-scales and the

measuring device) or *reliability* (number of respondents needed for a reproducible evaluation of departments or groups of departments). This chapter describes these two psychometric properties of PHEEM as determined in studies among medical students and residents.

PHEEM questionnaires completed by 256 medical students and 339 residents are analysed. Factor analysis and a Mokken-scale analysis fail to replicate the hypothesised three subscales. The analyses show only one dimension. Generalisability analysis shows that a feasible sample size suffices for a reliable outcome.

To sum up, this study indicates that PHEEM can demonstrate differences between departments with a feasible number of respondents. The (factor and Mokken-scale) analyses, however, do not confirm the construct hypothesised by the original designers: PHEEM measures only one construct. What this construct exactly consists of is a topic for further research.

Chapter 3 reports the results of a study of the characteristics of the ideal clinical teacher. Clinical teachers are important in the education of medical students and residents and are a major determinant of the clinical learning climate. In 1994 and 2003 residents in obstetrics-gynaecology were asked to state the characteristics of the ideal clinical teacher. Their answers are analysed using two strategies.

The first analysis is based on the 'traditional' medical education literature. Within this field many studies describe the desired characteristics of an ideal (clinical) teacher. Residents' answers fit within an earlier described framework of roles: the role of Physician, Supervisor, Teacher, and Person. Interestingly, almost half of all the responses correspond to the Person role. The second most frequently mentioned role in 1994 is the Physician role, whilst in 2003 it is the Supervisor role.

Next, a sociocultural perspective is used to analyse the data. This outlook emphasises the importance of social contexts and relationships within which learning takes place: a resident decides whether a teacher is ideal while interacting with this teacher. The characteristics of the ideal clinical teacher are related to direct interaction in 70% of the cases; 30% of the responses concern indirect interactions. An interesting finding is that residents value different, even opposite, characteristics of their ideal clinical teacher, depending on their personal needs.

This study emphasises the importance of personal interaction between residents and clinical teachers. The first analysis shows that residents value the Person role of their teachers. Between 1994 and 2003 the second most valued teacher characteristic changes, possibly due to the implementation of a more learner-centred curriculum. The second analysis shows that residents appreciate different characteristics. The ideal clinical teacher uses interaction to determine the specific needs of individual residents.

Chapter 4 studies medical students' perceptions of the clinical learning climate. Medical students from twelve different obstetrics-gynaecology departments complete the PHEEM.

Students from the highest and lowest scoring department are invited to participate in semi-structured individual interviews. An analysis method described by Miles and Huberman guides the interpretation of the data.

The results show that the department with the highest PHEEM score differs significantly from the department with the lowest PHEEM score. From these two departments fourteen medical students participate in interviews lasting 45-90 minutes. Analysis of these interviews shows that departments and medical students together determine the learning climate. Departments leave their mark on the learning climate by their approach towards student participation. This approach is manifested in the legitimacy of student participation in the department, clerkship organisation, and the involvement of teachers in medical students' personal development. Medical students can influence the learning climate in the initial phase of a clerkship by developing initiatives and feeling out the local dos and don'ts, and, later in the clerkship, by increasingly showing initiative or, by contrast, ceasing to do so. Some medical students talk about 'clerkship fatigue' caused by too many previous clerkship experiences and severely reducing their motivation to once again try and adapt to new local customs.

In summary, this study shows that departments and medical students *together* determine the clinical learning climate. How medical students participate is central to their perceptions of clinical learning climates. Departments can approach student participation 'expansively' or 'restrictively'. Another finding is that medical students seek to understand the explicit and implicit expectations and customs that characterise a department. If they can comply with the local conventions of a department, their learning climate is better. Departments can make it easier for medical students to understand departmental customs by being open about them.

In addition to *medical students'* perceptions, described in chapter 4, **chapter 5** depicts *residents'* perceptions of the learning climate. This two-step study aims to answer how optimal learning climates of residents are shaped. The first step consists of semi-structured interviews with fourteen residents from different specialties. In the second step of this study the interview findings are tested and further refined in three focus group discussions. The analysis of the data is again guided by the method described by Miles and Huberman.

Three interrelated themes are important in the eyes of the residents. An optimal learning climate combines (1) work and (2) training, tailored to (3) residents' specific attributes and needs. These three themes converge when a patient is discussed properly, when there is a safe atmosphere, and when there is a positive relationship with the supervisor (as is stressed in chapter 3 as well). Within the work theme residents value a well-balanced distribution of service and education, good collaboration with the team, and opportunities to influence daily work and adjust it to their personal developmental needs. Within their training residents value active learners (who seek feedback and are pro-active) and active supervisors (who take initiative to give feedback, teach, and assess) as well as a mutual introduction. Meetings where work related issues are discussed in an informative way improve the learning climate.

To sum up, this study illustrates that an optimal learning climate facilitates both 'traditional' learning (such as self study) and learning through participating in daily practice. In addition departments should appreciate residents' previous experiences and bring work and training in alignment with these experiences. Reciprocity with, for instance, nurses is an important theme as well: an imbalance can have a negative impact on the learning climate. Finally, residents state that small changes in daily practice can improve the learning climate.

Chapter 6 gives an account of the development and psychometric properties of a newly developed questionnaire to test the educational climate of residents, the Dutch Residency Educational Climate Test (D-RECT). This study aims to overcome the shortcomings described in chapters 1 and 2 of many questionnaires to measure the educational climate, such as absence of theoretical underpinnings and incompletely described psychometric properties. The definition of the learning climate described in chapter 5 serves as the theoretical basis for the development of the *preliminary* 75-item D-RECT. Thirty-eight experts judge this instrument in a Delphi procedure: in multiple rounds they indicate whether an item is to be included in the definitive D-RECT. Concurrently, 1278 residents in 26 specialties complete the preliminary D-RECT. The results of exploratory factor analysis of these questionnaires combined with the results of the Delphi panel lead to the *definitive* 50-item D-RECT. Further analysis of the instrument involves confirmatory factor analysis and a generalisability study. This results in eleven sub-categories representing 50 items and the finding that a reliable outcome can be achieved with a feasible number of residents. In conclusion, chapter 6 describes the development of a valid and reliable instrument to measure the learning climate of residents. D-RECT differs from other instruments, like the PHEEM, in having a solid theoretical basis, experts' input, and well-described and promising psychometric properties.

Chapter 7 summarises the previous chapters and draws several conclusions; describes the strengths and weaknesses of the studies, and presents educational implications and suggestions for further research.

As for conclusions, it is stressed that it is impossible to underestimate the importance of the value of learning through participation in daily activities and through becoming part of a team. In addition this thesis shows that the learning climate demands a reciprocal investment from learner and department. Also the pivotal role of clinical teachers is illuminated. Studies of instruments to measure the learning climate show D-RECT to be superior to the PHEEM, because of D-RECT's theoretical basis and psychometric properties and its possibilities to offer focused feedback to departments. Finally, this chapter presents a definition of the clinical learning climate based on the combined findings of the studies in this thesis.

These conclusions show that 'learning' is seen as more than the acquisition of knowledge and skills (so called 'acquisition learning'); 'learning' is also a continuous process in which a person becomes a part of a greater whole (so called 'participation learning').

The analysis of the strengths and weaknesses shows that the strengths of this thesis are the information-rich data, the various methodologies used to analyse the qualitative data and evaluate the measuring instruments, and the relevance of the findings to the daily practice of medical education. Weaknesses are the limited generalisability of the findings and the possibility of bias in the data analysis.

There are several implications for educational practice. In a time of drastic changes in postgraduate training, D-RECT can offer insights into the consequences of these changes and provide recommendations for which changes to retain or adjust so as to optimise the learning climate. Additionally, this thesis shows how departments can take a constructive approach to participation by learners. Finally, multiple studies stress that it is of major importance for supervisors to take in interest in the needs of learners and respond to them appropriately.

As for research, the psychometric quality of the D-RECT requires further study in other settings and D-RECT can serve as an outcome measure for intervention studies aimed at improving the educational climate. Studies of the perceptions of other parties involved in clinical training, such as nurses, may offer valuable insights, while observational research is likely to illuminate other interesting aspects of the clinical learning climate.