Unlimited exposure. The patient mix of GP trainees and their trainers: gaps, disparities, and active steering

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Summary
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Chapter 1
Earlier research suggests that the patient mix of GP trainees differs from their trainers and contains areas of low exposure, which may have consequences for the trainees’ competence development. This thesis focuses on the composition of the patient mix of 73 GP trainees and their trainers. In Chapter 1 the specific characteristics of the patient mix of Dutch GPs and the setting of the GP training are portrayed. Subsequently, the term ‘patient mix’ is defined and an important learning theory, deliberate practice, is presented. In Chapter 1 we introduce our method to get a clear picture of the patient mix of GP trainees. We used data extracted from electronic patient records (EPRs) to identify areas of low exposure and disparities between GP trainees and their trainers. Next we propose the possibility of increasing the exposure by actively steering the trainees’ patient mix.

Chapter 1 concludes by stating the research questions and by giving an exposition of the methodology of the CASANOVA (CASe AssigNment fOr GP VocA- tional training) project.

Chapter 2
In a systemic review, the empirical evidence about the contribution of patient mix in work-based learning is addressed. We conducted a literature search across Medline, Embase, Web of Science, ERIC and the Cochrane Library. Original, quantitative studies were included. After screening of 10,420 citations, 298 full-text articles were retrieved of which 22 were identified as relevant. Two reviewers extracted data using a coding sheet, and assessed the methodological quality of the studies. Operationalizations of patient mix were fairly different, allowing very few inferences from the studies. Learning outcomes were divided into self-reported and formal assessment.

We found a positive relationship between patient mix and self-reported outcomes evaluating the progress in competence as experienced by the trainee, such as self-confidence and comfort level. Patient mix was also found to correlate positively with self-reported outcomes evaluating the quality of the learning period, such as self-reported learning benefit, experienced effectiveness of the rotation, or the instructional quality. Supervision and learning style seemed to be mediating variables of the relationship between patient mix and learning.

A relationship between patient mix and formal assessment was rarely dem-
onstrated. Presumably, increasing experience only, does not automatically lead to more competence. However, most formal assessments were not study-specific and therefore probably not sensitive enough to ascertain how patient mix can affect learning outcome.

**Chapter 3**

To gain insight into the validity of our patient mix descriptions, the coding behaviour of the trainers and trainees was investigated in a questionnaire. Motivation-related, ICPC-system-related and external barriers of GP trainees and trainers while using ICPC coding were asked for. Results were compared with self-reported coding performance and actually measured EPR-based coding performance. Hence, coding bias, due to the barriers that GP trainers and trainees experience while using the ICPC classification system, was addressed.

The percentages of contacts with an ICPC code were high, both for GP trainers and for trainees. Trainers’ estimation of their coding performance was rather accurate, considering the high correlation with the actual coding percentage. For trainees this correlation was lower. Most participants reported always to register ICPC codes for consultations and home visits. Telephone consultations, repeat prescriptions and administrative actions were coded less frequently. Most participants never or rarely experienced coding barriers, an exception being the ‘insufficient refinement’ of the ICPC system. Most motivation and ICPC-related barriers correlated with self-reported and actual coding performance. In regression analyses ‘ICPC coding is unpleasant to use’ was found to predict the trainees’ coding percentage. This also predicted the trainers’ coding percentage, as did ‘no personal gain from ICPC’ and ‘coding is difficult’ (total variance explained was 41%). As no other relevant areas were prone to non-coding, EPR-derived data seem biased by non-coded telephone consultations only.

**Chapter 4**

To describe the patient mix of GP trainees and to study differences in patient mix between first-year and third-year GP trainees, a cohort study was started in 73 GP training practices. During a six-month period, aggregated EPR data about ICPC diagnosis codes and data on the gender and age of all patient contacts were collected. We extracted data directly from the EPR every three months. The raw extraction data were processed by multiple software routines. We programmed decision rules to ensure logic and consistency in counting the codes.
The number of patient contacts was not significantly different between the first- and third year trainees, but the standard deviation in the third year doubled. This was largely due to several trainees who saw exceptionally large numbers of patients.

Third-year trainees saw more patients between 45 and 64 years than did first-year trainees. Further differences were found between years 1 and 3 for diseases of the blood and blood-forming organs, psychiatric diseases and metabolic diseases. The mean number of chronic patients seen per trimester was 48.0 (SD 21.9) for first-year trainees and 62.4 (SD 32.5) for third-year trainees. Female trainees saw twice as many female conditions as male trainees did per trimester. Differences in patient mix between first- and third-year trainees seem at least partly related to year-specific learning objectives. The use of an EPR derived educational instrument provides a useful insight into the trainee’s patient mix.

Chapter 5

The results of the EPR based extractions of the 73 trainees were compared with the aggregated data of their 114 GP trainers. National morbidity figures of LINH 2009 and the second Dutch National Survey of General Practice were used as an external reference.

The results showed that trainers had double the number of face-to-face consultations, and treble the number of telephone consultations compared to trainees. Trainees’ patient mix consisted of significantly more patients with eye diseases, ear diseases, respiratory diseases, skin diseases and minor illnesses compared to their trainers. Trainers encountered significantly more patients with circulatory diseases, psychiatric diseases, metabolic diseases, male genital conditions, social conditions, chronic and oncological diseases. Female trainers and trainees encountered almost twice as much female conditions compared to their male compeers. Male conditions were seen more often by male doctors.

In conclusion, trainers and teachers at the specialty training must be aware of areas of low exposure. Trainers should ensure trainees handle more chronic, complex, psychosocial and circulatory conditions.

Chapter 6

In search for an explanation for the disparities between GP trainees and trainers found in chapter 5, the attitude of patients towards trainees has been extensively
studied. The assigning behaviour of the medical receptionist is another important factor that may be accountable for the disparities. We identified topics in the assigning behaviour of receptionists in a focus group. Subsequently, we designed a questionnaire to study assigning behaviour. The questionnaire was sent to 478 GP training practices in the Netherlands, 326 were returned (68%).

Most receptionists routinely asked for the reason for the consultation. The majority at least sometimes discussed with patients which doctor would be seen. Most receptionists have at least some latitude when assigning patients to either the trainer or the trainee. Most receptionists considered the patient mix of trainees and trainers to be similar. Almost all receptionists reported ‘often’ or ‘always’ assigning ‘every possible problem’ to the trainee. A similar picture arose regarding specific subpopulations. However, the receptionists reported that they assigned complex and new patients to the trainers more often than to the trainees. In conclusion, with some exceptions, receptionists try to assign trainees a varied patient mix.

**Chapter 7**

This chapter investigates whether patient mix can be steered by instructing medical receptionists, trainers and trainees in a randomized controlled trial. The 73 trainees were randomized into an intervention group and a control group. During two successive periods of three months, patients with skin conditions and psychosocial conditions were actively assigned to trainees in the intervention group (n=37). The patient mix was measured by EPR extracted data and compared with a baseline registration (Chapter 4 and 5). Learning outcome was measured by self-efficacy questionnaires and by a knowledge test.

No difference in increase was found in patient volume and diversity of the steered conditions in the intervention group as compared to the control group. However, the percentual increase of exposure to skin conditions was greater in the intervention group. No difference in skin conditions self-efficacy and psychiatric knowledge was found. The increase of psychosocial self-efficacy however, was greater in the intervention group. In regression analyses, patient volume was found to be a significant predictor of both skin and psychosocial self-efficacy. We conclude that steering the patient mix of a GP trainee is not as easy as it seems. We suggest to study the effects of tailoring patient mix to individual learning aims and to investigate the effects of predefined prerequisite exposure numbers on steering.
Chapter 8
In the first part of the general discussion the main findings are summarised for each chapter, followed by an interpretation of the results and the implications for the GP specialty training. In the second part of this chapter general educational implications for GP specialty training are discussed. Individual feedback reports, if combined with reference standards, either based on consensus or on group averages, will confront trainers and trainees with disparities. We expect that this approach leads to a variety of actions intended to tailor the patient mix to these reference standards, and to the individual learning needs of the trainee if the data are also linked to the trainee’s assessments. Whether this is effective for learning indeed should be further studied. For this, the implementation of a patient mix monitoring system is essential.