Course and predictors of perceived recording skills among Norwegian young doctors. A ten-year longitudinal study.

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Abstract

BACKGROUND: There is lack of research on predictors of perceived recording skills (PRS) among medical students and doctors. Good recording skills are important to ensure a quality medical record and thereby good patient care. In addition higher levels of PRS protect against stress related to clinical work among young physicians.

OBJECTIVE: To investigate whether attending different medical curricula or having certain personality traits predict the levels of perceived recording skills among medical students and young doctors.

PARTICIPANTS: All medical students at all four Norwegian universities (n = 421) were mailed questionnaires on entry to their medical course (T0). Respondents were surveyed again at the end (T1) of their 6-year courses as well as in their 4th post-graduate year (T2). The study sample comprised the 312 students who responded at all three time points (74%). Two of the universities organized their curriculum according to the traditional division between pre-clinical and clinical parts, with a comprehensive exam in between. At the two other sites the teaching of pre-clinical and clinical subjects was integrated. Perceived recording skills were measured by six items covering their preceding six patient interviews. The respondents evaluated their performance in obtaining the medical history using a seven point scale (Appendix).

RESULTS: Students graduating from a traditional curriculum have the same level of reported perceived recording skills as students from an integrated curriculum. The traditional curriculum students experience a greater increase in perceived recording skills than the integrated curriculum students from the last year of medical school to the 4th year after graduation. Extraversion predicted higher levels of PRS, neuroticism lower levels of PRS.
CONCLUSION: A traditional curriculum and the personality dimension of extraversion favors a positive development of perceived recording skills in the first years of the medical career.

**Introduction**

To our knowledge, there are no studies that examine the predictors of perceived recording skills. Good recording skills are essential to ensure a quality medical record, an important tool in the ward, containing information needed for documentation and for further treatment. An accurate medical history is necessary to make a correct diagnosis, initiate therapy, and it facilitates the optimal care for the patient. The degree of success in these activities, depends, in large part, on the communication- and interpersonal skills of the physician, including obtaining a medical history (1-10). Since the 80’ies, communication skills and recording skills have gained more attention (11), and has been taken into curricula of medical education. Bedside teaching has been pointed out as an important tool for learning communication skills and history taking (12-14). This way of teaching is utilized throughout the integrated curriculum, while only in the second half of the traditional curriculum. Seeing as many patients as possible improves recording skills among students as well as young physicians (12).

The role of training in improving communication skills has been investigated in several studies (5;11;15-17) and in particular recording skills (18-22)

Differences in the medical curriculum might predict different levels in students’ communication and recording skills. A traditional curriculum divides the medical education into a pre-clinical and a clinical part with no teaching in communication skills in the pre-clinical part. Another way of organizing the curriculum is to integrate pre-clinical and clinical teaching throughout the education, with an early introduction of communication teaching.
Some authors have advocated the need for training of these skills throughout the clinical curriculum (19;21;23-25)

Some studies have been done on perceived recording skills as well as observed recording skills. Actual skills and self reported skills were compared in a study by Fitzgerald (26). The study evaluated performance tasks (including history taking and examination of standardized patients) and cognitive tasks among 4th-year medical students. He found no gender differences and no relationship between self-assessment accuracy and students' characteristics, and concluded that students are fairly accurate in the self-assessment, compared to the objective performance standards.

The level of communication skills and relation to physicians’ health has been evaluated in several studies on mental health and burnout. Ramirez et al. found that high levels of stress at work precedes burnout and psychiatric morbidity among doctors, and burnout is more prevalent among physicians who feel insufficiently trained in communication- and management skills. Ramirez stated that good communication- and interpersonal skills definitely is needed to obtain the relevant information for the medical record (27). Perceived recording skills protect against stress related to clinical work among young physicians. In a model explaining job stress among house officers, perceived recording skills was an independent explanatory variable for job stress (28;29) Perceived recording skills was a significant predictor of job stress, even when controlled for background and personality factors (age, sex, the personality traits neuroticism, extraversion, conscientiousness), perceived medical school stress, and internship factors such as number of hours at work, number of hours asleep when on call, and learning environment.

On this background we have conducted a study on a nationwide representative sample of graduating medical students. On the individual level we wanted to investigate whether gender,
age, and personality traits like conscientiousness, extraversion and neuroticism predict the level of perceived recording skills. On the organisational level we wanted to explore if students in a curriculum with integrated training in communication skill, including recording skills, reported higher levels of perceived recording skills than students in a curriculum with a traditional division between pre-clinical and clinical parts.

Method

Participants

All medical students at all 4 Norwegian universities (n = 421) were mailed questionnaires on entry to their medical course (T0). Personality was assessed at this time point. Respondents were surveyed again at the end (T1) of their 6-year courses as well as 4 years after graduation (T2). The study sample comprised the 312 students who responded on all three time points. 374 responded at T0 (53.7% females), 366 at T1 (55.7% females), and 358 at T2 (58.1% females) Mean age at T0 was 22.1 (SD=3.1).

Please insert table 1 about here.

Variables

Dependent

The dependent variable was perceived recording skills (PRS). It was measured by six items, covering their preceding six patient interviews and medical records (Appendix), where the respondents evaluated their own performance in obtaining the medical record. The response alternatives were on a Likert scale from 1 (low) to 7 (high). Means of the sum score were used in the analyses.
Independent

Age

Age was measured as a continuous variable.

Gender

Females were coded 1 and males were coded 2.

Curricula

The curriculum differed in some respects between the four Norwegian medical schools. When the students started their medical education, two sites organized their curriculum according to the traditional division between pre-clinical and clinical parts, with a comprehensive exam in between (N=258). At the two other sites the teaching of pre-clinical and clinical subjects was integrated (N=116).

Personality

The personality traits neuroticism, extraversion, and conscientiousness were measured by a 27-item version of the Basic Character Inventory (BCI). (29;30) Each dimension is based on nine questions with a dichotomous response, giving a range from 0 (low) to 9 (high). Cronbach alphas were 0.76 for neuroticism, 0.77 for extraversion, 0.63 for conscientiousness. Using Pearson's r, the correlation between neuroticism and extraversion traits was r = 0.192 (P<0.001). For neuroticism and conscientiousness r = 0.133 (P<0.001). For extraversion and conscientiousness r = 0.131 (P<0.001)

Statistics

A linear mixed model was used to examine repeated measures of PRS, between the two types of curriculae, thus taking into consideration the interdependence of repeated measures on the same individuals. Predictors were incorporated in the same analysis. Thus, three analyses
were combined in this model: 1) Effect of time on PRS; 2) Effect of curriculum type on PRS; 3) Effect of predictors on the mean PRS (Mean of measurements on T1 and T2). SPSS version 14 was used. A significance level of p < 0.05 was used. The effect measures in the analysis output show the effect of the predictors on the mean PRS level.

Results

Det må komme inn noen tall her med spredningsmål

There were no significant differences in gender and age, when it comes to the prediction on PRS. The personality traits neuroticism and extraversion both significantly predict the level of PRS, whereas conscientiousness does not. If we look at estimates of effects on PRS as the dependent variable, we find that neuroticism has a negative effect on PRS, whereas extraversion has a positive effect. In the multivariate analyses these two are still significant, when controlled for age, gender, curricula, and perceived medical school stress.

The different curricula showed no significant

Concerning the development of PRS over time, a significant increase from the last year students to the 4th year after graduation was found, but no gender differences.

The PRS develops differently in the two curricula. The traditional curriculum has a greater increase in PRS than the integrated.

Please insert figure 1 about here.

Please insert table 2 about here.
Discussion

The most important finding in this study is that the integrated curriculum does not come up with higher Perceived recording skills at the end of medical school than the traditional medical school. This is the case for the 4th year after medical school as well. However there is a greater increase in PRS in the traditional curriculum compared to the integrated curriculum. In the integrated curriculum the students are exposed to teaching of communication skills, including recording skills throughout the medical school. Others have reported that students from traditional medical schools have higher levels of observed communication skills than the integrated schools, including organisation of the interview (10). A need for follow-up studies was underlined to investigate this further. We found this pattern to persist until the 4th postgraduate year in our study.

The positive effect of extraversion on the mean PRS is hardly surprising, as extroverts tend to direct their communication with others, and thus may direct the interview in an effective manner.

It is essential to enable teaching institutions to find interventions and teaching models that increases the general levels of PRS among their students, as this could ease the stress among interns and young physicians, and the serious consequences such as mental health problems, low job satisfaction and suboptimal patient care.

If Fitzgerald is right in his statement that perceived skills coincides with actual skills, we consider that focus on (perceived) recording skills, both in the teaching of students in universities, and in feedback from a teaching supervisor in internship, might do something positive to doctors’ mental health, job performance and patient care quality.

We anticipate that the more certain an intern on call is of his or her ability to obtain all relevant information for the medical record, the more it eases an already stressful situation.
Reference List


(10) Gude T. Observed communication skills. 2006. Ref Type: Personal Communication


Appendix

Perceived recording skills items:

1 It is difficult/easy to get a summary when the patient’s past medical history is long.

2 It is difficult/easy to formulate the present illness in the medical record.

These items were scored from 1 (difficult) to 7 (easy)

3 I manage to direct the interview so that I get the relevant information about the past medical history.

4 I easily get an overview of the progress of the present illness.

5 I manage to get the necessary information about the present illness.

These items were scored from 1 (uncertain) to 7 (certain)

6 I am sure about how to describe my findings from the physical examination.

This item was scored from 1 (never) to 7 (always)
### Table 1 Description of the independent variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>N (%)</th>
<th>Range</th>
<th>Mean (SD)</th>
</tr>
</thead>
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<tr>
<td>Age (T1)</td>
<td>19-39</td>
<td></td>
<td>21.6 (2.6)</td>
</tr>
<tr>
<td>Women %</td>
<td>124 (59)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vulnerability</td>
<td>0-9</td>
<td></td>
<td>3.7 (2.2)</td>
</tr>
<tr>
<td>Extraversion</td>
<td>0-9</td>
<td></td>
<td>5.2 (2.2)</td>
</tr>
<tr>
<td>Control</td>
<td>0-9</td>
<td></td>
<td>3.2 (2.1)</td>
</tr>
<tr>
<td>Traditional curriculum</td>
<td>148 (70,5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Integrated curriculum</td>
<td>62 (29,5)</td>
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### Table 2 Effect estimates of repeated PRS and of the independent variables on PRS, entered in the same model

<table>
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<tr>
<td>Time (T1 as reference)</td>
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<td>0.41***</td>
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<tr>
<td>Curriculum:</td>
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<td></td>
</tr>
<tr>
<td>Traditional curriculum (as reference)</td>
<td>1.6</td>
<td>0.17</td>
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<tr>
<td>Time *curriculum</td>
<td>-2.8</td>
<td>-0.32**</td>
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<td>Background:</td>
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<tr>
<td>Gender</td>
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<td>0.05</td>
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<tr>
<td>Age</td>
<td>0.4</td>
<td>0.006</td>
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<tr>
<td>Personality:</td>
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<tr>
<td>Neuroticism</td>
<td>-2.7</td>
<td>-0.05**</td>
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<td>Extraversion</td>
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<td>0.07***</td>
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<td>Conscientiousness</td>
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<tr>
<td>Medical school:</td>
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<td></td>
</tr>
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</table>

*=p<=0.05, **=p<0.01, ***=p<0.001
Figure 1 The course of PRS across curricula

Curriculum
- - integrated
--- traditional

Mean PRS

Time

1
2

5.20
5.00
4.80