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Communication Study

# The communication competency of medical students, residents and consultants

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ABSTRACT

*Objective:* The model of expert performance predicts that neither physicians in training nor experienced physicians will reach an expert level in communication. This study tested this hypothesis.
*Methods:* Seventy-one students, twenty-five residents and fourteen consultants performed a 'breaking bad news' exercise with a simulated patient. Their communication competency was assessed with the CELI instrument. Actor assessments were also obtained. The differences in communication competency between students, residents and consultants were established.
*Results:* The mean performance scores ranged from bad to adequate. An expert level of performance was seldom reached. Novice students scored lower than the other groups in their competency and in the actor assessment. First-year students scored lower than the consultants in their competency and in the actor assessment. No differences in performance were found between third-year students, interns, residents and consultants.
*Conclusion:* Students acquire a 'satisfactory' level of communication competency early in the curriculum. Communication courses in the curriculum do not enhance this level. Clinical experience has also a limited effect.
*Practice implications:* The learning conditions for deliberate practice must be fulfilled in medical curricula and in postgraduate training in order to provide medical students and physicians the opportunity to attain an expert level in communication.


## 1. Introduction

The CanMEDS model of medical professionalism which is the current standard in undergraduate and postgraduate medical training, requires an expert level in communication for practising physicians [1]. Comparable requirements for the communication of physicians can be found in consensus statements and other manuscripts [2–8]. However, the empirical evidence about the effect of communication skills training is not conclusive. Small to moderate improvements have been found in the communication competency of students after one or more communication courses [9–14], but a deterioration in the communication competency of students over time has also been reported [15,16]. Postgraduate communication courses also appeared to have positive effects on the communication competency of practising physicians [9,17–24], but these effects are limited [25–28]. Furthermore, clinical experience has little influence on the communication competency of students and physicians. Students improved their communication competency during their internships [29], but the skills of residents did not change during their residency period [30,31]. Aspegren [32] found no effect of clinical experience on the communication competency of experienced physicians. Students in their last year of medical school and senior registrars with little or no training in communication skills performed equally well on communication skills characteristic of social conversation. These skills were learnt spontaneously. However, both groups showed a low degree of professionalism with other important skills, such as structuring the conversation and being responsive to patients' concerns. These communication skills are not learnt despite ten or more years of clinical work.

Ericsson's model of acquisition of expert performance [33] provides an explanation for these limited effects of communication training and clinical experience. Expert performance is defined as reproducibly superior performance on tasks that capture the essence of expertise in the critical domain. The model states that after restricted training and experience an individual's performance is adapted to the typical situational demands. Upon reaching this satisfactory level the performance becomes stable and increasingly automated. Additional experience will not improve the behaviour and expert performance is never reached, since this requires the acquisition of complex integrated systems of representation for the execution, monitoring, planning and analyses of performance. These complex systems are only acquired from deliberate practice under specified learning conditions. Based on a review of research on skill acquisition Ericsson [33] lists the

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following learning conditions: (a) performing learning tasks with well-defined goals, (b) motivated to improve, (c) learning tasks of short duration with opportunities of immediate feedback, reflection and corrections, and (d) ample opportunities for repetition, gradual refinements and practice in challenging situations.

Nowadays, almost all medical curricula contain a programme for communication skills training. However, the learning conditions to achieve expert performance are most likely not fulfilled in these curricula. Especially the opportunities for students to review, refine and build on existing skills while at the same time adding new skills and increasing complexity, are absent [8]. According to Ericsson's model students will therefore only attain a 'satisfactory' level in communication competency but not an expert level as required by the CanMEDS framework. The model also predicts that clinical experience alone is not sufficient to reach an expert level. Experienced physicians will therefore have approximately the same communication competency as recently graduated physicians, provided they received approximately the same amount of communication training. If not, the communication competency of experienced physicians will even be inferior, since their clinical experience cannot compensate for their lack of communication training.

In this study we tested these predictions. Firstly, we expected to find a moderate improvement over the years in the communication competency of students until they have reached a satisfactory level. Secondly, we expected to find no effect of clinical experience on the communication competency of residents who received the same amount of communication training as the students. Thirdly, we expected experienced consultants who received hardly any training in communication skills, to have an inferior communication competency compared with interns and residents who received communication training in medical school.

## 2. Methods

### 2.1. Participants and procedure

In a cross-sectional study we compared the communication competency of four groups of students, a group of residents and a group of consultants at the University Medical Centre Groningen (UMCG), the Netherlands. The curriculum of the medical school contains a customary programme of several communication courses dispersed throughout the curriculum. The training and experience levels in communication, further denoted as training levels, of the groups were:

Level 1. Novice students ($N = 19$). These students had just entered medical school. They had not yet received any training in communication skills;
Level 2. First-year students ($N = 16$). In their first year at medical school these students followed a course in which physician-patient communication was addressed in lectures and small group teaching. They were also trained in listening skills by means of demonstration and role-play;
Level 3. Third-year students ($N = 18$). In their second year these students followed training in history taking. In their third year they were trained in patient education skills. In this course they were also taught about, but not trained in, challenging communication issues, such as handling emotional distress, non-compliance and demanding patients;
Level 4. Fifth-year students/interns ($N = 18$). These students were now in the second year of their internships in the distinctive specialties. They finished their Bachelor's period in an earlier curriculum than the first- and third-year students. They followed a comparable programme in communication skills as the third-year students, except that they were not trained in patient education skills. They also had some experience in interviewing real patients;
Level 5. Residents ($N = 25$) in their first or second year of training for different specialties. Although the residents differed somewhat in the amount of communication training they received in medical school, their average training was comparable with the training of the interns. They also had ample experience of clinical and outpatient consultations;
Level 6. Consultants ($N = 14$) at three departments of the UMCG. These consultants had many years of experience of clinical and outpatient consultations, but they received little or no training in communication skills in medical school or in postgraduate courses.

The 110 participants performed a consultation with a simulated patient in which they had to inform the patient about a disappointing diagnosis and had to agree on a follow-up with the patient. There are two reasons why we found this scenario of 'breaking bad news' particularly suitable for measuring the communication competency. Breaking bad news is a challenging communication issue that a physician must handle effectively [1]. A physician (in training) who is able to perform this bad news consultation adequately, demonstrates the mastery of a wide variety of communication skills, such as active listening, explaining, planning, support and staying in control of the conversation and the relationship [7,32]. Secondly, all participants except the novice students were taught the principles and guidelines of breaking bad news. However, none of the participants participated in a skills training in breaking bad news. Thus, for all participants the performance of the bad-news consultation was an unfamiliar exercise.

Before the consultation, the participant read a description of the case with information about the patient's background, the diagnostic results, the prognosis and the treatment options. The participant was also given the opportunity to discuss the medical aspects of the case. In this way we prevented a lack of medical knowledge from interfering with the performance of the communication skills. The students participated voluntarily in the study. For the residents and consultants the exercise was part of a communication course.

Eleven cases relating to different sorts of cancer and progressive chronic diseases were used for the exercise. Twenty-three experienced actors played the role of the patient. Some actors acted in several cases several times, while other actors acted in one case only once. The cases and actors were randomly divided among the groups of participants. All consultations were registered on video tape.

The principal investigator (JW) and two psychology students assessed the 110 consultations using the CELI instrument which is described below. Both students were trained in the use of the instrument by the principal investigator, they had ample experience in the rating procedure within the scope of other research and were guided by a manual. The raters worked independently and observed each consultation at least twice in order to obtain accurate assessments. They gave preliminary ratings during the first observation and adjusted and completed their ratings during the second observation. The inter-rater reliability of the scores was checked by calculating the Intraclass Correlation Coefficients for absolute agreement for the three individual raters [34].

### 2.2. Measures

The CELI instrument is based on a model of patient education which distinguishes four subcompetencies: *C*ontrol, *E*xplaining, *L*istening and *I*nfluencing [35]. The instrument assesses the quality

of a physician's competency in patient education by assigning scores to the performance of the distinctive communication skills that belong to each of the four subcompetencies. A communication skill is defined as an utterance, i.e. a discrete and observable instance of verbal and/or non-verbal behaviour, by which the physician contributes to the efficient attainment of the conversational objectives [36]. The performance of a skill is assessed on a four point scale: −2 = bad, −1 = inadequate, +1 = adequate, +2 = good. The skills are evaluated for their intrinsic quality, i.e. how well the skill was performed, and for their contextual quality, i.e. at which moment in the consultation the skill was performed [26]. Each utterance receives a score for the performance of the skill which the utterance represents. This skill score consists of the letter of the subcompetency to which the skill belongs and a performance score. For example, if the physician adequately reflects the feelings of the patient, this utterance is scored L + 1, meaning the adequate performance of a listening skill. The rules for these ratings are set out in an illustrated manual.

From these skill scores four subcompetency scores and an overall competency score are calculated which range from 0 (very bad performance) to 10 (excellent performance). This range of 0–10 is common in the Dutch school system and therefore easy for Dutch people to interpret. A score of 5, which represents an equal number of positive and negative skill scores, means a mediocre performance of a subcompetency or the overall competency. In an earlier study the inter-rater reliability, convergent validity and construct validity of the CELI instrument appeared to be satisfactory [35].

In order to cross-validate the CELI scores the actors assessed the quality of the consultation on several aspects immediately after the consultation. This actor assessment yielded a score from the patient's perspective for the quality of the consultation varying between 0 (disastrous quality) to 10 (outstanding quality). Since other studies reported moderate to low relationships between the assessments of trained observers and actor assessments [37–40], we expected to find a moderate agreement between the CELI scores and the actor assessments.

### 2.3. Analyses

(1) Intraclass Correlation Coefficients for absolute agreement with participants and raters as random effects in the two-way ANOVA model (ICC2(A,1) = ICCa) were calculated in order to check the inter-rater reliability;
(2) Intraclass Correlation Coefficients for absolute agreement (ICC2(A,1) = ICCa) and for consistency (ICC2(C,1) = ICCc) between the mean CELI scores of the three raters and the actor assessments were calculated in order to cross-validate the CELI assessments and the actor assessments;
(3) Univariate analyses of variance for each of the CELI subcompetencies, the overall competency and the actor assessment as dependent variables with the training level (levels 1–6) as between-subjects factor. The differences of the means of the CELI subcompetencies, the overall competency and the actor assessment between each pair of training levels were further analyzed with *t*-tests with Bonferroni adjustments for multiple comparisons.

All statistical analyses were performed with SPSS 15.0.0 [41].

## 3. Results

### 3.1. Inter-rater reliability of CELI scores

The first column in Table 1 presents the ICCa's of the three raters for each of the four subcompetencies and for the overall competency score. The ICCa's were all above 0.75, which is the minimal requirement for a useful instrument [34]. In our further analyses we used the mean of the CELI scores of the three raters as scores of the CELI subcompetencies and the overall competency.

### 3.2. Comparison of CELI scores and actor assessment

The ICCa's between the CELI subcompetencies and the actor assessment and between the overall competency and the actor assessment varied between 0.346 and 0.507 (Table 1, second column). These correlations were calculated for 92 participants only, since we could not register the actor assessments of the 18 interns. The ICCc's between the CELI subcompetencies and the actor assessment and between the overall competency and the actor assessment varied between 0.452 and 0.592 (Table 1, third column). The slightly higher coefficients for consistency were due to the actors' systematically higher scores for the quality of the consultation compared with the scores for the CELI subcompetencies and the overall competency.

### 3.3. Differences in CELI subcompetencies, overall competency and actor assessment between students, residents and consultants

The mean performance scores ranged from 2.56 (=bad) for the Listening skills of the novice students till 6.99 (=adequate) for the Control skills of the consultants. The mean overall competency scores ranged from 3.68 (=insufficient) for the novice students till 6.32 (=almost adequate) for the consultants. The third row of the training levels 4, 5 and 6 in Table 2 show that some interns, residents and consultants obtained a maximum score of 10 for one of the subcompetencies which means that their performance was excellent in that subcompetency. The highest overall competency score of 8.39 (=good) was obtained by one of the residents. None of the participants received an outstanding mark from the actors.

The univariate analyses of variance (ANOVA) of the four subcompetencies, the overall competency and the actor assessment as dependent variables and the training level as between-subjects factor yielded a significant effect of the training level for all dependent variables with *F*-values between 3.98 and 12.68.

Table 2 also presents a summary of the *t*-tests for each pair of training levels with Bonferroni adjustments for multiple comparisons. The fourth row of each training level indicates for each dependent variable whether this training level significantly ($p < 0.05$) differs from the other training level(s). The novice students (level 1) scored significantly lower than the other students for their Listening subcompetency and their overall competency. They also scored lower than the third-year students and interns for the Control subcompetency. Compared with the residents and consultants they scored lower for all dependent variables. The first-year students (level 2) differed from the consultants in the Control and Influencing subcompetencies and in their overall competency. Their actor assessments were lower than

**Table 1**
Intraclass Correlation Coefficients.

| CELI subcompetencies | Three raters | CELI (sub)competencies vs actor assessment | |
|---|---|---|---|
| | ICCa | ICCa | ICCc |
| | *N* = 110 | *N* = 92 | *N* = 92 |
| Control | 0.759 | 0.485 | 0.547 |
| Explaining | 0.772 | 0.456 | 0.494 |
| Listening | 0.828 | 0.346 | 0.463 |
| Influencing | 0.758 | 0.443 | 0.452 |
| Overall competency | 0.877 | 0.507 | 0.592 |

**Table 2**
CELI subcompetencies, overall competency and actor assessment of students, residents and consultants.

| Training/experience level | | CELI (sub)competencies | | | | | |
|---|---|---|---|---|---|---|---|
| | | Control | Explaining | Listening | Influencing | Overall comp. | Actor assess. |
| 1. Novice students | Mean | 3.53 | 4.10 | 2.56 | 4.78 | 3.68 | 4.68 |
| *N* = 19 | Std. error of mean | 0.46 | 0.36 | 0.31 | 0.35 | 0.27 | 0.51 |
| | Min/max | 0.48/7.53 | 1.62/8.12 | 0.00/4.70 | 1.03/7.07 | 1.25/5.88 | 2.00/9.00 |
| | Differs from level: | 3 4 5 6 | 5 6 | 2 3 4 5 6 | 5 6 | 2 3 4 5 6 | 3 ? 5 6 |
| 2. First-year students | Mean | 4.46 | 5.16 | 5.04 | 5.21 | 5.01 | 5.31 |
| *N* = 16 | Std. error of mean | 0.34 | 0.40 | 0.38 | 0.50 | 0.31 | 0.39 |
| | Min/max | 2.14/6.67 | 1.27/7.36 | 2.06/7.16 | 0.00/8.30 | 1.75/6.85 | 2.00/8.00 |
| | Differs from level: | 6 | | 1 | 6 | 1 6 | 5 6 |
| 3. Third-year students | Mean | 5.20 | 5.53 | 5.33 | 6.01 | 5.52 | 6.72 |
| *N* = 18 | Std. error of mean | 0.45 | 0.38 | 0.30 | 0.37 | 0.29 | 0.27 |
| | Min/max | 1.87/8.22 | 1.90/8.26 | 3.04/7.61 | 2.82/8.91 | 2.95/7.69 | 4.00/8.00 |
| | Differs from level: | 1 | | 1 | | 1 | 1 |
| 4. Interns | Mean | 5.87 | 5.56 | 6.03 | 5.79 | 5.79 | ? |
| *N* = 18 | Std. error of mean | 0.52 | 0.51 | 0.33 | 0.39 | 0.30 | (*N* = 0) |
| | Min/max | 2.44/9.74 | 1.94/10.00 | 3.25/8.43 | 3.55/10.00 | 3.98/8.22 | ? |
| | Differs from level: | 1 | | 1 | | 1 | ? |
| 5. Residents | Mean | 5.92 | 6.14 | 5.13 | 6.24 | 5.76 | 6.82 |
| *N* = 25 | Std. error of mean | 0.38 | 0.31 | 0.31 | 0.30 | 0.24 | 0.35 |
| | Min/max | 3.02/10.00 | 2.24/8.93 | 1.62/7.42 | 2.25/8.37 | 3.68/8.39 | 2.00/9.00 |
| | Differs from level: | 1 | 1 | 1 | 1 | 1 | 1 2 |
| 6. Consultants | Mean | 6.99 | 6.31 | 5.50 | 6.90 | 6.32 | 7.64 |
| *N* = 14 | Std. error of mean | 0.43 | 0.39 | 0.47 | 0.21 | 0.22 | 0.21 |
| | Min/max | 4.67/10.00 | 3.11/8.78 | 1.25/7.78 | 5.74/8.55 | 4.72/8.37 | 6.50/9.00 |
| | Differs from level: | 1 2 | 1 | 1 | 1 2 | 1 2 | 1 2 |
| Total | Mean | 5.31 | 5.47 | 4.90 | 5.81 | 5.33 | 6.22 |
| *N* = 110 | Std. error of mean | 0.20 | 0.17 | 0.17 | 0.16 | 0.14 | 0.20 |
| | Min/max | 0.48/10.00 | 1.27/10.00 | 0.00/8.43 | 0.00/10.00 | 1.25/8.39 | 2.00/9.00 |
| ANOVA | *F*= | 7.263 | 4.154 | 12.681 | 3.983 | 11.096 | 9.494 |
| | *p*< | 0.000 | 0.002 | 0.000 | 0.002 | 0.000 | 0.000 |

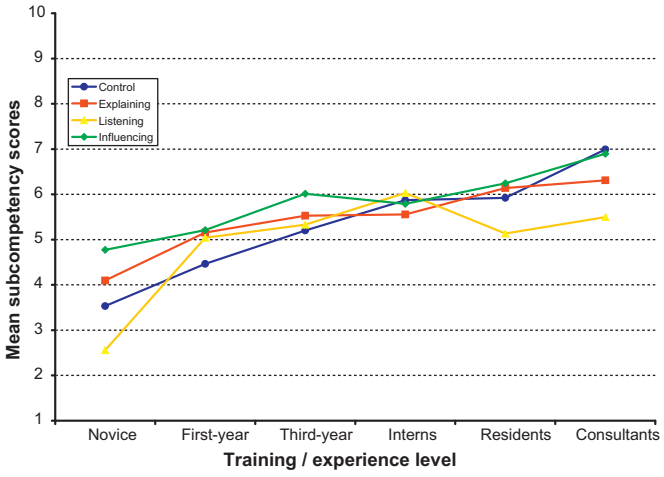


**Fig. 1.** CELI subcompetencies of students, residents and consultants.

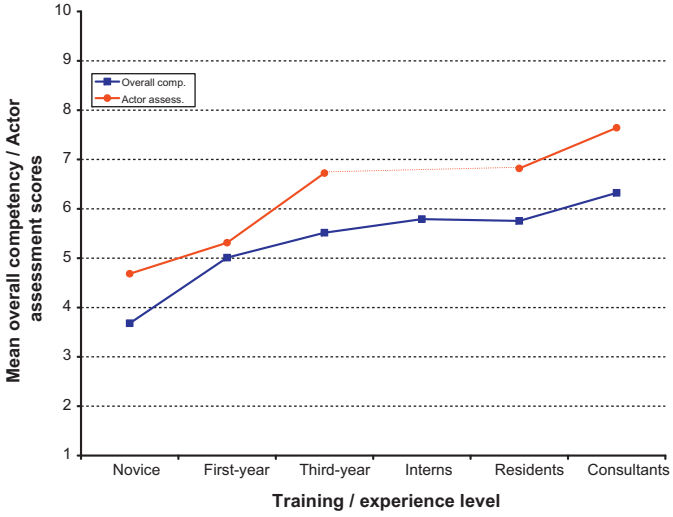


**Fig. 2.** Overall competency and actor assessments of students, residents and consultants.

those of the residents and the consultants. No differences in performance were found between third-year students, interns, residents and consultants.

Fig. 1 shows a gradual and linear growth in the Control, Explaining and Influencing subcompetencies over the training levels. The Listening subcompetency had a curvilinear relationship with the training level. Further analyses revealed that the mean scores for the Listening subcompetency of the novice students, the residents and the consultants were significantly lower than the mean scores for their other subcompetencies.

Fig. 2 shows a gradual and linear growth in the overall competency and the actor assessment over the training levels with a significantly higher mean score for the actor assessments compared with the overall competency scores for all training levels, except for the first-year students.

## 4. Discussion and conclusion

### 4.1. Discussion

In this study we compared the communication competency and more specifically the competency in patient education of medical students, residents and consultants. All participants performed a consultation in which they had to convey a disappointing diagnosis to a simulated patient. Their communication competency was established by three raters with the CELI instrument, which distinguishes four subcompetencies in patient education: *C*ontrol, *E*xplaining, *L*istening and *I*nfluencing. The scores for these

subcompetencies and for overall competency were calculated and the actor assessment was also established.

Our results indicate that the effect of successive communication courses in a curriculum on the communication competency of students is limited. The novice students who received no communication skills training at all had inferior Control and Listening subcompetencies and overall competency than the third-year students and interns. However, they performed equally well in their Explaining and Influencing subcompetencies as the other students.

The first-year students had a better Listening subcompetency than the novice students, which is in line with our expectations, since these students were trained in listening skills in their first-year communication course. The first- and third-year students and the interns performed equally well in all CELI subcompetencies and overall competency. Their actor assessments were also the same. This finding is contrary to our expectations, since the third-year students and the interns followed additional communication courses in their second, third and fourth year. The third-year students in particular were taught supplementary skills for patient education, such as explaining and influencing. Apparently, these skills did not sink in.

The residents who received the same amount of communication training as the interns performed equally well on their subcompetencies and overall competency as the first- and third-year students and the interns. Only their actor assessments were higher than those of the first-year students. As we expected, the clinical experience of the residents had no effect on their communication competency. There even seems to be a decline in their listening skills, since their Listening subcompetency was significantly lower than their other subcompetencies.

Although we presumed that the clinical experience of the consultants would not compensate for their lack of communications skills training in medical school, their clinical experience appeared to have a positive effect on their communication competency. Their subcompetencies and overall competency were equal to those of the senior students and residents. They apparently succeeded in upgrading their communication competency in clinical practice to the same level as the senior students and residents. Their clinical experience had the least positive effect on their Listening subcompetency, because this subcompetency was significantly lower than their other subcompetencies. However, their Control and Influencing subcompetencies were better than those of the first-year students. It is interesting to note that the Control and Influencing skills receive less attention than the Listening and Explaining skills in most medical curricula.

We conclude that the communication skills of students improve in their first year to a level which their teachers apparently consider satisfactory. This satisfactory level is also demonstrated by the students of higher years and the residents. The residents' clinical experience does not add to the quality of their performance. The consultants are also able to reach the same satisfactory level with their clinical practice. However, an expert level of performance as required by the CanMEDS framework is not achieved. These findings are in line with the findings of Aspegren [32] and correspond with Ericsson's model [33]. The model states that expert levels of performance can only be achieved by deliberate practice in specified learning conditions. From Ericsson's review [33] and the recommendations of others [4,5,7,8,26,32,42–46] the following learning conditions can be formulated for communication skills training: (a) clear and comprehensive objectives about which skills have to be learned and how to teach them in simulated consultations, (b) stimulating learning tasks of short duration with opportunities for immediate feedback, reflection and corrections, (c) ample opportunities for repetition and gradual refinements of performance, (d) possibilities for individual students to rehearse their existing skills frequently in different sorts of consultations and to acquire new skills in challenging consultations of an increasing complexity, and (e) transfer of the learned skills into real life consultations/clinical practice. These learning conditions are apparently not fulfilled in medical curricula and postgraduate training.

The inter-rater reliability of the CELI instrument was adequate and corresponded with the reliability in our earlier study [35]. As expected, the agreement between the actor assessments and the CELI subcompetencies and overall competency was moderate. The actor assessments were also systematically higher than the overall competency scores for all training levels except for the first-year students. We conclude that the actors evaluated not only the communication skills but also other aspects of the behaviour and general appearance of the participants. From our data we could not discover the nature of these other aspects that led to the higher assessment by the actors.

The internal and external validity of this study is compromised by several factors. We did a cross-sectional study instead of a longitudinal study with small groups of students, residents and consultants. The participants were not compared with themselves over the years and no control groups were used.

All students followed the same curriculum. This could jeopardize the generalizability of our results. However, this curriculum contains a customary, representative programme of communication skills training. The educational background of the residents and consultants was mixed, but typical of the background of specialist physicians.

The students participated voluntarily, while the residents and consultants performed the 'breaking bad news' exercise as part of a compulsory communication course. This could mean that the participating students were more interested in communication and therefore performed better than the 'average' students of their group.

The performance of all participants could also have been influenced by the fact that the exercise was unfamiliar for them. This was especially the case for the students, since the residents and consultants already performed bad news consultations in clinical practice. Furthermore, the students lacked the medical knowledge and clinical experience of the case, although we tried to compensate for this deficiency by giving them medical information about the case and the opportunity to discuss the case. However, our results do not indicate a substantial effect of this advantage on the residents' and consultants' communication competency.

### *4.2. Conclusion*

Students acquire a satisfactory level of communication competency in a medical curriculum which contains several communication courses dispersed throughout the curriculum. However, this level is already reached early on in the curriculum and does not increase substantially in later years. Furthermore, clinical experience has a limited effect on the communication competency of physicians. Residents with ample clinical experience do not perform better than interns. However, consultants are able to reach the same satisfactory level of performance as the residents and senior students despite their lack of communication skills training in medical school.

Although some individual students and physicians reached an excellent level of performance in a single subcompetency, the mean performance of students and physicians does not exceed the level of performance which is presumably regarded as satisfactory by their teachers and colleagues. We think that the majority of them will remain at this 'satisfactory' level of competency, unless

the learning conditions for achieving an expert level of performance are fulfilled.

### 4.3. Practice implications

In order to realize the learning conditions for deliberate practice the teaching of communication has to change from a minority sport to a mainstream activity in medical schools and postgraduate education [8]. Several authors [6,8,42–47] give suggestions how to achieve this goal. Further research could focus on whether the communication competency of students and residents will grow to an expert level when these learning conditions are eventually fulfilled.

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