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Chapter 5

Instructiveness of feedback during clerkships: influence of supervisor, observation and student initiative

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ABSTRACT

Background Several authors assume that the supervisor's role, observation of behaviour and students' active participation are important factors in the instructiveness of feedback.

Aim This study aims to provide empirical evidence for these expectations.

Methods For two weeks, 142 clerks from eight hospitals recorded for each individual feedback event: who provided the feedback, whether the feedback was based on observation of behaviour, who initiated the feedback moment and the perceived instructiveness of the feedback. Data were analysed with multilevel techniques.

Results The perceived instructiveness of feedback provided by specialists and residents did not differ significantly. However, both were perceived to be more instructive than feedback from nursing and paramedical staff ($\beta_{\text{specialists}} = 0.862, p < 0.01$; $\beta_{\text{residents}} = 0.853, p < 0.01$). Feedback on behaviour that had been directly observed was reported to be more instructive than feedback on behaviour that had not been observed ($\beta_{\text{observed}} = 0.314, p < 0.001$). Feedback which stemmed from student initiative or a joint initiative was experienced to be more instructive than feedback which ensued from the supervisor's initiative ($\beta_{\text{student}} = 0.441, p < 0.01$; $\beta_{\text{joint}} = 0.392, p < 0.01$).

Conclusions The expectations concerning the influence of observation and student initiative on the instructiveness of feedback were confirmed in this empirical study. Expected differences in instructiveness between feedback from specialists and residents were not confirmed.

INTRODUCTION

There is no doubt about the suitability of the day-to-day clinical environment as a place for students to learn and develop their competences. However, optimal learning in this authentic medical setting obviously requires proper guidance. Clinical supervision plays a vital role in the medical setting and increases student performance levels.¹⁻⁵ Feedback is an important aspect of supervision during clerkships.^{1,2,6,7} It can encourage students to change their behaviour and therefore enhance performance.⁷

The literature suggests that different aspects of feedback enhance the learning outcomes: the role of the supervisor, observation of behaviour and active participation of the learner.^{1,6-8} These factors have been highlighted, but thus far little empirical evidence has been presented concerning their influence on the instructiveness of feedback. Therefore, we examined the influence of the supervisor, observation and student initiative on the perceived instructiveness of feedback.

Supervisor

During their clerkships, students associate with and receive feedback from several physicians and other health care professionals. From previous research we know that teaching behaviour affects student performance.⁹ Stern *et al.* showed a small positive effect of the attending physicians' teaching ability on student knowledge.¹⁰ This effect was not found for residents' teaching ability.¹⁰ Based on this research, other authors stated that the quality of feedback can be inferred from the seniority of the person providing it.^{11,12} Because students are generally coached by junior doctors rather than academic clinical staff,¹¹⁻¹⁵ serious doubts about the quality of feedback may be warranted.^{11,12} Since the contribution of nursing and paramedical staff to the clinical training of medical students is not fully documented,¹⁶ feedback provided by this group of health care professionals will be analysed as well. In accordance with the findings in the literature we hypothesized:

- 1 specialists' feedback is perceived as most instructive, followed by feedback from residents. Feedback from nursing and paramedical staff is perceived as least instructive.

Observation

Feedback is interpreted as a positive or negative reinforcement, as a result of which performance improves.¹⁷ From an educational perspective, it is assumed that feedback is most instructive when the supervisor has observed the student's behaviour.¹⁸ This means that feedback should be based on first hand observations of trainees' performances.⁸ However, it is also known that, due to tight time constraints, faculty members fail to observe medical students.⁶ Consequently, feedback is often based on student information or other second or third hand data. Feedback on behaviour that has been observed is supposed to stimulate learning primarily, because the supervisor is able to provide focused information and can compare student performance to performance standards.^{1,7,8} To provide empirical evidence for these expectations we hypothesized:

- 2 feedback based on observation of behaviour is perceived as more instructive than feedback not based on observation of behaviour.

Student initiative

Considering learning to be a constructive and self-directed process implies that the recipients of feedback play an important role in the learning process.^{19,20} It is important that students have some control over and input into the supervisory process.^{1,7} Consequently, they should actively participate in the feedback process.⁸ Taking the initiative to ask for feedback is one form of active learning. In this way, feedback connects to students' learning needs and improves their internal motivation. Accordingly, feedback initiated by students is expected to be most instructive, which leads to the hypothesis:

- 3 student initiative exerts a positive influence on the perceived instructiveness of feedback.

In summary, instructive feedback is essential for students' clinical learning processes. The extent to which the supervisor, observation of behaviour and student initiative are actually responsible for variations in the perceived instructiveness of feedback is not fully known and will be analysed empirically in this study.

METHODS

Context and participants

This study was conducted during the academic year 2005 – 2006 at the University of Groningen, the Netherlands. The six-year medical curriculum of the Faculty of Medical Sciences is problem-based and patient-centred, which means that the patient's problem is the central issue of the curricular modules and their educational elements. During the last two years of the curriculum, students participate in clerkships at the university medical centre or in affiliated hospitals. One university hospital (University Medical Center Groningen) and seven affiliated hospitals were involved in this study. The clerkship period of the curriculum is divided into two sections: an intramural section (rotations A – D) with intensive supervision, and a section in which students act more independently (rotations E and F), outside the hospitals mentioned above. Participants ($n = 142$) in this study were students who attended rotation A, B, C, or D. Anonymity was guaranteed and all clerks provided informed consent.

Procedure

We developed a form on which students had to register all moments they received *individual feedback on their behaviour*. A pilot study ($n = 17$) was performed to try out and improve the form. Students received the form and an accompanying letter containing an explanation of the study. They were asked to fill in the form daily for a period of two weeks and to return it afterwards in a sealed envelope. Participating students received a EUR 15 gift voucher.

Measures

Students were asked to record all moments they received *individual feedback on their behaviour*, which was defined as comments/remarks concerning work or behaviour of an individual student. Furthermore, they were asked to register: a) who provided the feedback, b) whether the feedback was based on observation of behaviour and c) who initiated the feedback moment. The students were also asked to rate the perceived instructiveness of the feedback moment (5-point Likert scale: 0 = not instructive, 4 = very instructive).

The variable 'supervisor' refers to the individual who provided the feedback. Three groups of potential supervisors were distinguished: 1) specialists, 2) residents and 3) nursing and paramedical staff. The variable 'observation' indicates whether the feedback was: 1) based on direct observation of behaviour or 2) not based on observation of behaviour. The 'initiator' refers to the person who initiated the feedback: 1) the student, 2) the supervisor or 3) a joint initiative of both student and supervisor. Because the instructiveness might be influenced by the student's gender and level of experience (clerkship rotation),¹ these variables were also assessed.

Statistical analysis

Each participating student reported several feedback moments. Therefore, the perceived instructiveness of each moment cannot be regarded as statistically independent.²¹ Accordingly, the dataset is hierarchically structured and consists of two levels; the level of 'feedback moments' (level 1) which are nested inside 'students' (level 2). These data called for a multilevel analysis. The multilevel analysis is carried out by the following procedure.

First, an empty model that includes the constant only (i.e. no explanatory variables) was estimated. Accordingly, we could disentangle variation in 'perceived instructiveness' associated with feedback moments (level 1) and students (level 2). Second, a main effects model estimated all independent

variables simultaneously in order to estimate their joint effects on 'perceived instructiveness'.

Finally, a third model estimated all main effects and their interactions. The interactions between the independent variables were added in a stepwise procedure. Only interaction terms that significantly improved the fit of the main effects model were retained. Whether a new model implied an improvement over the main effects model was determined on the basis of the difference in deviance. The deviance is a measure of discrepancy between model and data. A decline in discrepancy means that the model represents the data more accurately. Whether this difference is significant is tested by means of a chi-square test, with the number of degrees of freedom equal to the number of added parameters. The significance of the contribution of each independent variable was determined by dividing its coefficient by its standard error. The significance of the resulting value was determined with a *t*-test.²¹ The final model presented here only contains the significant effects. The data were analysed with the multilevel computer program MLwiN (version 2.01).

RESULTS

From the 142 participating students, 21 were excluded because they had filled their forms inaccurately or incompletely. The remaining 121 respondents (85%) came from all eight hospitals; 78% of them were women, which is slightly more than the 69% population average. In total, 1065 feedback moments were registered. This is an average of 4.4 individual feedback moments per student per week. The overall mean of 'perceived instructiveness' was 2.92 (SE = 0.87, scale 0-4). Students received most individual feedback moments from specialists (68.3%). Feedback was mostly based on behaviour that had not been observed (61.5%) and 22.3% of the feedback moments was initiated by the student. More descriptive figures are presented in Table 1.

Table 1 Feedback moments (number): percentage breakdown of responses

Variables	Total (1065)	%	
		Men (251)	Women (814)
Supervisor			
Specialists	68.3	80.1	64.6
Residents	22.5	17.9	24.0
Nursing and paramedical staff	9.1	2.0	11.4
Observation			
Observed	38.5	22.7	43.5
Not observed	61.5	77.3	56.5
Initiator			
Student	22.3	16.7	24.1
Supervisor	26.5	25.5	26.8
Joint	51.2	57.8	49.1

The empty model revealed that 37.3% of the variance was at student level and the remaining 62.7% was associated with the level of feedback moments. The main effects model showed an improved fit compared to the empty model ($\chi^2 = 56.459$, $df = 9$, $p < 0.001$), (Table 2).

Adding interactions improved the fit even more ($\chi^2 = 17.490$, $df = 4$, $p < 0.01$) and this model will be presented in more detail (Table 2). Feedback from specialists or residents was perceived as more instructive than feedback from nursing and paramedical staff ($\beta_{\text{specialists}} = 0.862$, $p < 0.01$; $\beta_{\text{residents}} = 0.853$, $p < 0.01$). No significant differences were found between specialists and residents (specialists as reference category, $\beta_{\text{residents}} = -0.009$, $p = \text{n.s.}$).

Feedback on behaviour that had been directly observed was experienced as more instructive than feedback on behaviour that had not been observed ($\beta_{\text{observed}} = 0.314$, $p < 0.001$). Feedback resulting from student initiative or a joint initiative was experienced as more instructive than feedback initiated by the supervisor ($\beta_{\text{student}} = 0.441$, $p < 0.01$; $\beta_{\text{joint}} = 0.392$, $p < 0.01$). No significant difference was found between student and joint initiative (student as reference category, $\beta_{\text{joint}} = -0.049$, $p = \text{n.s.}$).

In general, women evaluated the instructiveness of feedback significantly higher than men ($\beta_{\text{women}} = 0.938, p < 0.01$). The interaction effects show that this difference was larger for feedback from nursing and paramedical staff than for feedback from specialists ($\beta_{\text{women*specialists}} = -0.673, p < 0.05$) and residents ($\beta_{\text{women*resident}} = -0.767, p < 0.05$). Furthermore, compared to the supervisor initiative the gender difference declines when feedback is based on a joint initiative ($\beta_{\text{women*joint}} = -0.338, p < 0.05$) or student initiative ($\beta_{\text{women*student}} = -0.573, p < 0.001$).

Students participating in their first clerkship rotation experienced the feedback as being most instructive ($\beta_{\text{b}} = -0.310, p < 0.05$; $\beta_{\text{c}} = -0.465, p < 0.01$ $\beta_{\text{d}} = -0.253, p = 0.061$). No significant interactions were found between 'supervisor', 'observation' and 'initiator'.

DISCUSSION AND CONCLUSIONS

This study aimed to provide empirical evidence of the influence of the supervisor, observation of behaviour and student initiative on the perceived instructiveness of feedback. The findings suggest that feedback from specialists and residents did not differ significantly. However, both were perceived to be more instructive than feedback from nursing and paramedical staff. In addition, observation of behaviour was found to be important for the perceived instructiveness of feedback. Students reported feedback to be more instructive when it resulted from student initiative or a joint initiative than when it was initiated by the supervisor. The fact that no interactions were found between 'supervisor', 'observation' and 'initiator' indicates that each of these variables influences the perceived instructiveness of feedback independently.

Table 2 Multilevel analysis for perceived instructiveness of feedback moment

	Empty model	Main effects model
Variables	Coeff. (SE)	Coeff. (SE)
Intercept	2.852 [†] (0.056)	2.723 [†] (0.198)
Supervisor (ref #: nursing and paramedical staff)		
Specialists		0.282 [†] (0.105)
Residents		0.182 (0.114)
Observation (ref #: not observed)		
Observed		0.313 [†] (0.057)
Initiator (ref #: supervisor)		
Student		-0.001 (0.071)
Joint		0.131*(0.063)
Gender (ref #: men)		
Women		-0.026 (0.126)
Clinical rotation (ref #: rotation A)		
B		-0.315*(0.155)
C		-0.470 [†] (0.170)
D		-0.245 (0.166)
Variance		
Between students	0.290 (0.048)	0.235 (0.041)
Within students	0.487 (0.022)	0.472 (0.022)
Deviance	2428.520	2372.061 [†]

* $p < 0.05$; [†] $p < 0.01$; [‡] $p < 0.001$; SE = standard error; # ref: reference group

The results of our study only partly support expectations expressed in recent literature. Our findings indicate that feedback provided by specialists was not experienced as being significantly more instructive than feedback from residents. As a consequence, our first hypothesis was not fully confirmed. Therefore, concerns about the quality of feedback provided by residents could not be affirmed.^{11,12} A possible explanation is that even though specialists are expected to have the best overview of their subject matter, a resident is better able to relate to the students' way of thinking.

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Main effects and interactions model					
Main effects	Interactions with supervisor, initiator and observation				
	Supervisor		Observation	Initiator	
	Specialists	Residents	Observed	Student	Joint
Coeff. (SE)	Coeff. (SE)	Coeff. (SE)	Coeff. (SE)	Coeff. (SE)	Coeff. (SE)
1.909 [†] (0.362)					
0.862 [†] (0.347)	-	-	-	-	-
0.853 [†] (0.350)	-	-	-	-	-
0.314 [†] (0.057)	-	-	-	-	-
0.441 [†] (0.155)	-	-	-	-	-
0.392 [†] (0.139)	-	-	-	-	-
0.938 [†] (0.366)	-0.673*(0.363)	-0.767*(0.369)	-	-0.573 [†] (0.174)	-0.338*(0.154)
-0.310*(0.153)	-	-	-	-	-
-0.465 [†] (0.168)	-	-	-	-	-
-0.253 (0.164)	-	-	-	-	-
0.226 (0.039)					
0.466 (0.022)					
2354.571 [†]					

Feedback provided by specialists or residents was experienced as more instructive than feedback from nursing and paramedical staff. Since patient care is inherently interprofessional, we think that it is important that students receive feedback from different professional groups working in the hospital, so our finding is undesirable. A possible explanation is given by Sachdeva who describes the importance of the perceived power and credibility of the person providing feedback.⁷ The difference between men and women concerning feedback from nursing and paramedical staff might

be caused by the fact that men deal differently with hierarchical structures in hospitals than women.²²

The second hypothesis concerning observation of students is confirmed by the data. In line with educational theories,^{8,17,18} feedback on behaviour that has been directly observed is experienced to be more instructive than feedback on behaviour that has not been observed. As explained in the introduction, the supervisor is better able to compare student behaviour with behavioural standards, which stimulates learning.^{1,7,8} In addition, students probably feel to be taken more seriously when the supervisor observes their behaviour. This in turn may positively influence their judgement of the instructiveness of feedback. Moreover, in cases of feedback on behaviour that has been directly observed, students can more easily verify whether they have understood the feedback correctly and ask additional questions.

On the basis of the literature about self-directed learning and student control over the supervisory process, we hypothesized that student initiative would positively influence the perceived instructiveness of feedback.^{1,7,8,19,20} Our findings show that the variable 'initiator' indeed influences the perceived instructiveness of feedback. Feedback initiated by the student was not perceived as more instructive than feedback based on a joint initiative. However, feedback based on student initiative or a joint initiative was perceived as more instructive than feedback initiated by the supervisor. Women evaluated the instructiveness of feedback significantly higher than men. This difference is largest when feedback is initiated by the supervisor and declines when feedback is based on a joint initiative or is initiated by the student.

Surprisingly, the descriptives indicate that women more frequently asked for feedback than men. Accordingly, we assume that women did not feel reluctant to ask for feedback. Keshet *et al.* found gender differences concerning student attempts to achieve influence in an environment in which they have a low status.²³ Men were found to use 'masculine'-type

strategies more frequently and 'feminine'-type strategies less frequently than women. The women's way of asking for feedback is probably not congruent with the hierarchical culture of hospitals. This mismatch could cause bad timing or divergent ways of asking feedback, which may result in reporting less instructive feedback. More research is needed to explain these results. Moreover, it is important to include gender differences in future research on feedback.

A strength of this study is the relatively large and diverse group of students, which increases the generalisability of the findings. Students participated in different disciplines and in eight different hospitals, both university and affiliated. Studies till now have usually focused on the importance of feedback in general or on single characteristics of feedback; in this study, we analysed several characteristics of feedback at the same time. By analysing the data using a multilevel analysis, we took account of the hierarchical structure and dependency of the measurements. Furthermore, students recorded their feedback moments during two weeks which improves the reliability of our findings.

A possible limitation of our study relates to the way the variable 'perceived instructiveness' is measured. In this study, instructiveness is based on students' experiences. The perceived instructiveness may differ from the actual educational value. However, earlier studies have revealed that measurements on the so-called reaction level are very valuable.²⁴ The actual number of men taking part in our study is rather small. However, the number is sufficient for a multilevel analysis. The number of feedback moments per student seems relatively low. Other studies also revealed a small amount of feedback.¹³⁻¹⁵ Furthermore, this finding can be explained by this study's focus on moments students received *individual feedback on their behaviour*. Students were instructed not to report, for example, moments of deliberation between students and clinical staff when they did not receive feedback on their actual behaviour.

Our study provided empirical evidence that observation of student behaviour is indeed important for the instructiveness of clinical feedback. Accordingly, we advise to integrate observation of student behaviour into students' learning processes during clerkships. However, the results of this study did not reveal differences in perceived instructiveness between feedback provided by specialists or residents. More involvement of specialists and residents could cover the need for the time-consuming observation of student behaviour. Future research is needed to examine why students experience feedback from nursing and paramedical staff as less instructive. Differences in perceived instructiveness might partly be caused by the content of the feedback. It is important to explore whether different professional health care workers provide feedback on different aspects of student behaviour, and whether this influences the perceived instructiveness of feedback. Furthermore, the influence of the supervisor's gender on the perceived instructiveness of the feedback should be analysed to explain the gender differences we found in this study. It would particularly be interesting to analyse the interaction between student gender and the gender of the supervisors.

The importance of student initiative seems to differ for men and women. Supervisors should be aware of this gender difference while providing feedback. Gender differences should be taken into account, not only in future studies but, moreover, while discussing self-directed learning and the students' role in managing their supervisory process.

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