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Effectiveness of a training program in supervisors' ability to provide feedback on residents' communication skills

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Johanna Sommer · Anne Gut · Anne Baroffio · Diana Dolmans ·
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Abstract Teaching communication skills (CS) to residents during clinical practice remains problematic. Direct observation followed by feedback is a powerful way to teach CS in clinical practice. However, little is known about the effect of training on feedback skills in this field. Controlled studies are scarce as well as studies that go beyond self-reported data. The aim of the study was to develop and assess the effectiveness of a training program for clinical supervisors on how to give feedback on residents' CS in clinical practice. The authors designed a pretest–posttest controlled study in which clinical supervisors working in two different medical services were invited to attend a sequenced and multifaceted program in teaching CS over a period of 6–9 months. Outcome measures were self-perceived and observed feedback skills collected during questionnaires and three videotaped objective structured teaching encounters. The videotaped feedbacks made by the supervisors were analysed using a 20-item feedback rating instrument. Forty-eight clinical supervisors participated (28 in the intervention, 20 in the control group). After training, a higher percentage of trained participants self-reported and demonstrated statistically significant improvement in making residents more active by exploring residents' needs, stimulating self-assessment, and using role playing to test strategies and checking understanding, with effect sizes ranging from 0.93 to 4.94. A training program on how to give feedback on residents' communication skills was successful in improving clinical

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supervisors' feedback skills and in helping them operate a shift from a teacher-centered to a more learner-centered approach.

Introduction

Feedback has been defined as "information describing students or house officer's performance in a given activity that is intended to guide their future performance in the same or in a related activity" (Ende 1983). Giving effective feedback is seen an essential skill in medical education and a critical link in any teaching–learning interaction (Branch and Paranjape 2002). From a behavioral perspective, it reinforces or modifies behavior (Thorndike 1931). From a cognitivist perspective, feedback stimulates reflection and helps learners reconstruct knowledge by analyzing and integrating experience in one's knowledge and understanding (Cantillon and Sargeant 2008; Sargeant et al. 2009). It has been especially described as an effective teaching tool in clinical settings where clinical skills are best observed and acquired (Neher et al. 1992). Effective feedback can change positively medical students', residents', or trained physicians' performance, whatever their level of training or experience and whatever the setting (Horiszny 2001; Veloski et al. 2006).

Several faculty programs were developed to improve teaching skills in clinical practice but their effects on feedback were not well studied (Steinert et al. 2006). Most of them assessed feedback through one single item and/or relied on self- or students'- reports (Cole et al. 2004; Hewson et al. 2001; Skeff et al. 1999; Stone et al. 2003). Only a few training programs focused specifically on objective measures of improvement by using observational ratings (Berbano et al. 2006; Marvel 1991; Salerno et al. 2002). Training seemed to lead to more frequent feedback, more high-level analytic synthetic questions, more specific and focused feedback, or more reinforcement. However, none of these studies included a control group.

Feedback on physicians' behavior is a common and effective strategy used in communication skills training programs (Hulsman 1999; Berkhof et al. 1999). Direct observation followed by well-intentioned, detailed and descriptive feedback is considered to be one of the most powerful ways to teach communication skills in clinical practice (Aspegren 1999; Kurtz et al. 2005). Nevertheless, teaching and evaluation of students and residents' communication skills in a clinical context remain deficient (Busari et al. 2005; Holmboe et al. 2004). There is some evidence that clinical supervisors fail to teach communication skills by lack of knowledge in both communication skills and effective teaching skills (Junod Perron et al. 2009a).

A large training program was developed in the United Kingdom to enable general practitioners to teach communication skills to students, residents and other health professionals (Draper et al. 2002). It combined both communication and teaching skills training. Although it appeared to be successful, it was not designed as a formal intervention and was, therefore, never assessed beyond qualitative reports (Draper et al. 2002). We postulated that training clinical supervisors simultaneously in both communication and feedback skills with emphasis on both patient and learner centeredness principles and use of experiential methods would increase their ability to give feedback on residents' communications skills in clinical practice.

According to Kirkpatrick, the impact of training can be evaluated through 4 outcomes dimensions (Kirkpatrick 1996): (1) reaction—self-report measures; (2) learning criteria, which relate to how much participants learn; (3) changes in participants' behaviours, further divided into the ability to perform the newly acquired skill at the end of training (Alvarez et al. 2004) and transfer to the job (Tannenbaum et al. 1993); finally, (4) criteria to evaluate change in the system.

The aim of the study was to assess the effectiveness of a training program in how to give feedback on residents' communication skills on several levels of Kirkpatrick's model (reaction, learning and behavior—training performance) by using a pre-post, control group experimental design.

Methods

Design and participants

We conducted a pre-post, control group non-randomized study to assess the impact of an intervention aimed at improving the teaching skills of clinical supervisors in providing feedback on residents' communication skills. The study was conducted in two clinical settings of the Geneva University Hospital, Geneva, Switzerland: the division of general internal medicine (inpatient) and the division of primary care (outpatient). All clinical supervisors available for the training (no holidays, no rotation on ICU/emergency, no maternity leave: $n = 65$) were asked to volunteer for the study. The control group included clinical supervisors from the division of general internal medicine who would not be available to follow the training sessions but volunteer for the study and clinical supervisors from the medical outpatient clinic of Lausanne University, the organization of which is very similar to our division of primary care. We chose to involve an external structure because the size of the Geneva division of primary care did not allow the recruitment of a sufficient number of control subjects.

The intervention phase

The intervention consisted of a training program given over 6 months. The content and format of the training program was tailored to clinical supervisors' and residents' needs and adapted to institutional constraints (Junod Perron et al. 2009a, b). The first part included 4–5 90-min small group training sessions (4–6 participants) spread over 3 months with simulated patients where participants would practice simultaneously communication and teaching skills. Participants had to play alternatively the roles of the supervisor, the clinician interviewing the patient, or the observer during 3–5 min sequences. As supervisors, they were trained to identify and name the poor or good communication skills used by the clinician and integrate them into a short feedback. Communication issues included "explaining a procedure", "breaking bad news", and "conducting a difficult family discussion" for the inpatient setting; "explaining a diagnosis", "managing time consultation with a talkative patient", and "managing a difficult consultation" for the outpatient setting. The second part consisted of 2 1-h individual coaching sessions organized 2 and 3 months after the initial training: sessions during which participants were videotaped while giving a feedback to a simulated resident during the pre-intervention phase objective structured teaching encounters (OSTEs) were reviewed and discussed with a coach according to supervisors' needs and learning objectives (Fig. 1). Much emphasis was put on the

structure of the feedback, as well as the importance of defining a learning objective with the learners, stimulating them to make a self-assessment, making them active in the solving process, and checking for understanding at the end of the session according to general feedback principles.

The instrument

The feedback rating scale

In the absence of a feedback rating scale described in the literature and fitting our needs, we developed a rating scale to assess the structure and the content of teaching skills used by clinical supervisors during the feedback sessions. It was based on a review of literature on learning theories and feedback (Cantillon and Sargeant 2008; Hattie and Timperley 2007; Hewson and Little 1998; Kluger and DeNisi 1996; Kurtz et al. 2005; Richardson 2004). Given the close similarities existing between a clinical encounter and a teaching encounter (Marvel 1991; Milan et al. 2006), we used the structure of the MAAS-Global
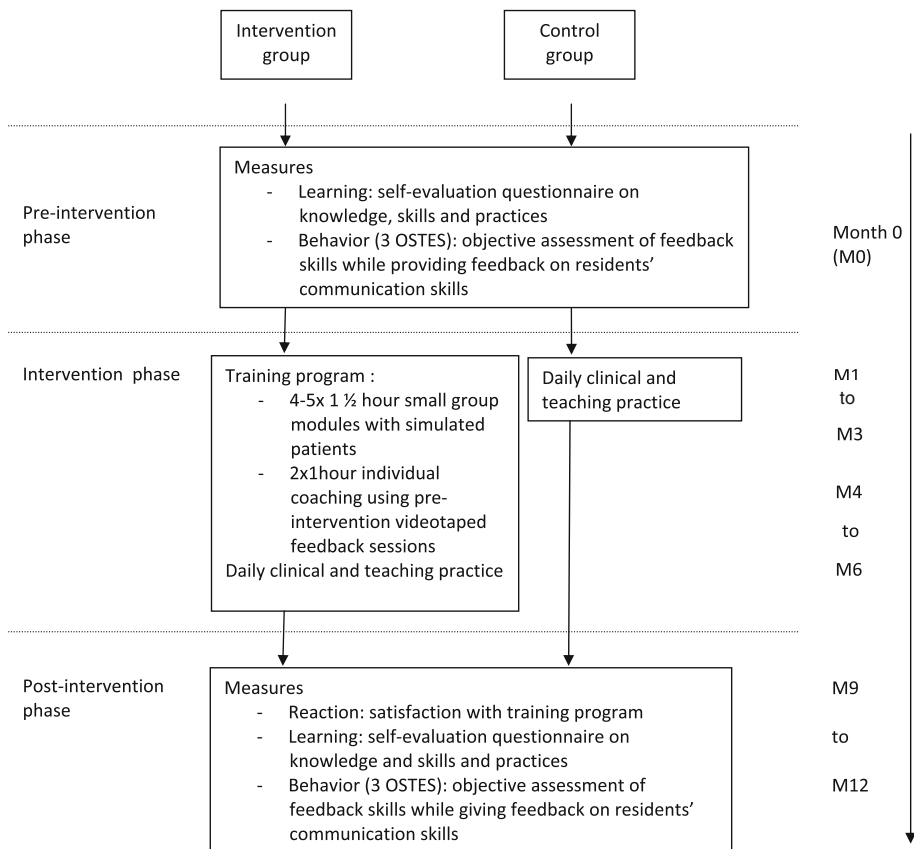

Fig. 1 Overview of the intervention conducted and evaluation measures collected among inpatient and outpatient clinical supervisors

Score, a well-known communication skill coding instrument as a frame for the scale (van Thiel et al. 1991). The feedback scale consisted of 14 specific items, 5 global dimensions and a global rating item. The 14 specific items were integrated into 4 chronological steps: (1) introduction/self-assessment, (2) feedback, (3) solving process, (4) conclusion. All items are listed in Table 4. Each item could be rated using a 6-point Likert scale (0 = absence–5 = perfectly done). The rationale and the definition of each item were discussed with and validated by a local group of teachers and researchers involved in medical education. The rating scale was tested and refined, after observation of 50 videotaped feedback sessions. A coding book was developed, including precise definitions and illustration of ratings for each item. The videotaped feedback sessions were analyzed by a research assistant trained to use the feedback rating scale and blinded to the intervention/control group attribution and the pre- and post-phases.

Procedure/outcomes measures

Reaction to the training program

At the end of the training, participants were asked to fill out a satisfaction survey. The survey included respectively 14 items for the small group sessions and 7 items for the individual coaching sessions, using a 5-point Likert scale (1 = do not agree, 5 = fully agree).

Learning (self-reported knowledge and skills acquisition) and practices

Before and after intervention, participants were also asked to fill out a self-report questionnaire focused on socio-demographic data, clinical and teaching experience, attitude towards communication skills, level of training and skills in giving feedback using a Likert scale and finally on methods actually used in clinical practice to teach communication skills.

Behavior: observation of feedback skills during OSTEs

During the pre- and the post-intervention phases, participants from both intervention and control groups were asked to go through 3 OSTEs (Simpson et al. 1992). OSTEs consisted of watching three videotaped short clinical encounters between a simulated resident and a simulated patient. Simulated residents were 5th or 6th year medical students who were trained to model an average level student. Videotaped clinical encounters focused on the same communication issues addressed during the training program (explaining a procedure, breaking bad news, and conducting a difficult family discussion for the inpatient setting; explaining a diagnosis, managing time with a talkative patient, and managing a difficult consultation for the outpatient setting) (Table 1). After watching the short videotaped clinical encounter, clinical supervisors gave feedback to the simulated resident; it was a two-way real interaction between the clinical supervisor and the simulated resident lasting about 9 min during which the clinical supervisor provided feedback to the simulated resident on the use of his/her communication skills. These OSTEs were videotaped and collected for analysis (using the feedback rating scale). Short clinical encounters shown in the pre- and post-intervention phases differed in terms of patient or resident

Table 1 Scenarii of videotaped short clinical encounters with simulated residents and patients used for the pre- and post-intervention phases

	Pre-intervention phase	Post-intervention phase
Inpatient setting		
Explanation	Sixty-eight year old man admitted in hospital for asthenia and weight loss. The resident is observed during the ward visit during which he informs the patient that he will need a colonoscopy.	Sixty year old man treated in hospital for heart failure, develops a new post-renal insufficiency. The resident is observed during the ward visit during which he explains to the patient that he will require a transrectal ultrasound and a cystoscopy.
Breaking bad news	A 61 year old man is admitted for a cough and chest pain. After several investigations, the diagnosis of lung cancer with liver metastasis is made. The resident is observed while informing the patient about the diagnosis.	A 53 year old woman is admitted for pleural effusion, shortness of breath and cough. After several exams, the diagnosis of pleural cancer (mesothelioma) is made. The resident is observed while informing the patient about the diagnosis.
Difficult family discussion	A 73 year old man, known for lung cancer treated by surgery and radiotherapy, is admitted for respiratory insufficiency. Oncologists suspect a cancer recurrence but give up any chemotherapy. A transfer to a palliative center is planned. The daughter wants him to go to a lung rehabilitation center. The resident is observed while discussing the transfer with the patient and his daughter.	A 80 year old woman is admitted for anemia. Investigations reveal a gastric cancer. The patient does not want any cancer treatment and wants to go home. The daughter wants her to go through a cancer treatment. The resident is observed while discussing the discharge with the patient and her daughter.
Outpatient setting		
Explanation	A 65 year old man, recently retired, asks for a check-up. A blood test, repeated at 1 week interval, confirms the presence of a diabetes. The resident is observed while informing the patient about the diagnosis.	A 25 year old woman consults for a dry cough and shortness of breath at exertion. The history, the physical exam and allergologic tests confirm the diagnosis of allergic asthma to dust mites. The resident is observed while informing the patient about the diagnosis.
Time management with a talkative patient	A 58 year old woman, known for high blood pressure, dyslipidemia, knee osteoarthritis and depression is seen by the resident every month to check blood pressure, mood and joint pain. She tends to talk a lot and comes continuously up with new complaints. The resident is observed during the beginning of the consultation (introduction and history taking).	A 52 year old man, known for diabetes, atrial fibrillation, abdominal bloating, headache, back pain, and depression is seen once a month to check his different health problems. He tends to talk a lot and comes continuously up with new complaints. The resident is observed during the beginning of the consultation (introduction and history taking).
Difficult consultation	A 54 year old man, known for several problems and complaining about weight loss and intermittent diarrhea was ordered a coloscopy. The resident is observed while informing the patient about the results of the coloscopy. She realizes that the patient had the wrong exam (rectoscopy) by her fault and the patient is very angry at her.	A 38 year old woman, known for fibromyalgia and treated by paracetamol, ibuprofen and occasionally tramadol, was recently given an SSRI antidepressor without being informed that she could develop symptoms resulting from the interaction between tramadol and the SSRI anti-depressor. The resident is observed at the beginning of the next consultation where the patient is very angry at her because of the development of a serotoningergic syndrome.

gender/age and type of disease but were comparable in terms of communication skills difficulties.

Statistical analysis

We used χ^2 tests and Wilcoxon rank sum test to analyze potential differences in sociodemographic and training/teaching experiences between the intervention and control groups. A linear regression model was built to assess post-intervention score differences in self-perceived teaching skills, with both group and pre-intervention scores as independent variables. χ^2 test was used to assess changes in the type of teaching methods used in clinical practice between both groups before and after intervention.

For each item of the feedback rating scale, we calculated a mean derived from individual scores within each group. Differences of post-intervention scores in the feedback rating skills were assessed using a linear regression model with both group and pre-intervention scores as independent variables. p values under 0.05 were considered significant (with Bonferroni correction, $p < 0.0045$ for self-learning data and $p < 0.0025$ for behavior data). Effect sizes were also calculated (Hojat and Xu 2004). Intercoder reliability of coding, measured by blind double coding of 10 % of the videotaped feedback sessions, led to an intraclass correlation of 0.81.

Results

Out of 65 clinical supervisors, 51 volunteered to take part into the study (78 %), 31 in the intervention group and 20 in the control group. Three participants from the intervention dropped out before the end of the intervention by lack of availability: finally 28 clinical supervisors finished the training program: 16 from inpatient setting and 12 from the outpatient setting. The control group included 20 participants, 12 from the division of general interne medicine and 8 from the medical outpatient clinic of Lausanne.

Baseline participant characteristics

Participants' characteristics did not differ in terms of age (median age-control: 32.6 years (range 28–43); intervention: 35.5 years (range 29–59), $p = 0.06$), gender (women-control: 40 % and intervention: 42.3 %, $p > 0.99$), years of clinical experience (median-control: 8.0 years (range 3–16); intervention 9.5 years (range 3–26), $p = 0.19$) and years of clinical teaching (median-control 2.0 years (range 0–11); intervention 2.0 years (range 0–18), $p = 0.38$) between both groups. Similarly, there was no statistically significant difference in participants' baseline self-perceived knowledge in communication skills and teaching skills (Table 2, first columns of each group), nor a statistically significant difference in observed feedback skills in the pre-intervention OSTEs (Table 3: two first columns). All participants attended at least 80 % of small group sessions and 100 % of individual coaching sessions.

Reaction to the intervention (training program in teaching communication skills)

The 28 participants of the intervention group were very satisfied with the training program: mean score of the self-reported surveys (21 items) was 4.7, SD (0.26) on a 5 point Likert scale (1–5). They especially highly rated the fact that the training was adapted to their

Table 2 Participants' self-perceived learning before and after intervention (5-item Likert scale: 1 = poor, 5 = excellent)

Items	Intervention N = 28			Control N = 20			Delta difference	p	Effect size
	Pre Mean (SD)	Post Mean (SD)	Delta (SD)	Pre Mean (SD)	Post Mean (SD)	Delta (SD)			
Knowledge in communication skills	3.07 (0.72)	3.64 (0.49)	0.57 (0.92)	2.90 (0.72)	3.00 (0.65)	0.1 (0.55)	0.47	<0.001	0.66
Importance of teaching CS	4.61 (0.69)	4.54 (0.58)	−0.07 (0.54)	4.65 (0.59)	4.65 (0.49)	0 (0.46)	−0.07	0.76	−0.12
Knowledge in teaching skills	2.30 (0.91)	3.82 (0.39)	1.52 (1.01)	2.25 (0.79)	2.37 (0.96)	0.11 (0.88)	1.41	<0.001	1.8
Skilled in acknowledging learners' needs	2.60 (1.00)	3.60 (0.82)	1.00	2.80 (0.77)	2.79 (0.98)	0 (1.04)	1.29	0.04	1.29
Skilled in making learners active	2.92 (1.04)	3.77 (0.76)	0.79 (1.18)	3.12 (0.60)	3.05 (0.85)	−0.12 (1.15)	0.92	0.013	1.53
Skilled in adapting to learners' needs	3.08 (0.95)	3.81 (0.75)	0.67 (1.2)	3.00 (0.52)	3.21 (0.85)	0.13 (0.83)	0.53	0.025	1.03
Skilled in facilitating small group learning	2.28 (1.14)	3.00 (0.89)	0.62 (1.31)	2.50 (0.99)	2.05 (0.78)	−0.53 (1.13)	1.16	0.007	1.2
Skilled in giving a feedback	3.24 (0.93)	4.04 (0.53)	0.83 (0.92)	2.94 (0.77)	3.16 (0.83)	0.07 (0.88)	0.77	<0.001	0.99
Skilled in organizing role plays	1.92 (1.12)	2.68 (1.07)	0.67 (1.31)	2.29 (0.92)	2.21 (1.08)	−0.31 (0.79)	0.98	0.02	1.06
Skilled in working with simulated patients	1.92 (1.08)	2.64 (1.15)	0.62 (1.01)	2.06 (0.93)	1.95 (1.03)	−0.2 (1.08)	0.82	0.04	0.89
Skilled in taking unplanned opportunities to teach	3.32 (0.99)	3.81 (0.57)	0.46 (1.14)	3.44 (0.96)	3.68 (0.89)	0.27 (0.88)	0.19	0.10	0.2

If Bonferroni correction is applied, p is significant under a value of 0.0045 (0.05/11)

Table 3 Self-reported teaching methods used by participants to teach communication skills in everyday clinical teaching before and after intervention

Items	Pre			Post		
	Intervention $N = 28$ N (%)	Control $N = 20$ N (%)	p	Intervention $N = 28$ N (%)	Control $N = 20$ N (%)	p
No teaching method used	4 (14.8)	6 (30.0)	0.29	1 (3.6)	5 (25.0)	0.07
To demonstrate skills	21 (77.8)	16 (80.0)	1.00	22 (78.6)	20 (100)	0.03
Direct observation and feedback	13 (48.1)	15 (75.0)	0.08	23 (85.2)	19 (95.0)	0.38
Videotape and feedback	2 (7.4)	1 (5.0)	1.00	2 (7.4)	1 (5.0)	1.00
Theory/explanations	12 (44.4)	6 (30.0)	0.37	23 (85.2)	11 (55.0)	0.04
Readings	6 (22.2)	2 (10.0)	0.44	5 (18.5)	2 (10.0)	0.68

needs (4.68), provided active and meaningful learning (4.87) and highlighted the trustful training atmosphere of small groups training sessions (4.84). They considered that most of what was learned could be used in practice (4.84). Participants unanimously recommended the individual video-based coaching sessions.

Learning: self-perceived knowledge, skills acquisition and practices

After intervention, the level of self-perceived knowledge in communication skills and teaching skills increased in a statistically significantly way in the intervention group according to the linear regression adjusting for pre-test scores (Table 2). A higher percentage of them described having improved not only their feedback skills but also other teaching skills (small group learning, role playing, working with simulated patients) with effect size ranging from 0.89 to 1.2. In addition, after intervention, a higher percentage of them reported giving theoretical explanations on communication skills and issues (Table 3). The percentage of participants reporting use of direct observation followed by feedback did not differ between both groups after the intervention.

Behavior: observation of feedback skills in OSTEs

The intervention group improved significantly after training in most categories and dimensions of the feedback assessed through 3 OSTEs according to the linear regression adjusting for pre-test scores (Table 4). Statistically significant differences before and after intervention pertained to the following aspects: eliciting positive and to be improved points; making the learner active in finding solutions; use of role playing to show or test strategies; checking for understanding at the end of the feedback with effect size ranging from 0.93 to 4.94 and to a lesser extent putting a ease the learner, exploring their feelings/needs and defining learning objectives, limiting feedback to a few items and including self-assessment points (effect size from 0.38 to 0.83). Their scores improved significantly in all global dimensions such as empathy, pedagogical effectiveness, structure of the feedback, verbal balance and relevance of the feedback content (effect size ranging from 0.58 to 1.66). Scores for items such as "use of acquired skills in different situations" and "future learning plans" remained consistently low before and after intervention. Interestingly, participants from the control group also improved to a lesser extent in the following items:

Table 4 Participants' observed feedback skills before and after intervention (6-item Likert scale: 0 = absent; 5 = perfectly done)

Items	Intervention N = 28			Control N = 20			Delta difference	p	Effect size
	Pre Mean (SD)	Post Mean (SD)	Delta	Pre Mean (SD)	Post Mean (SD)	Delta			
Introduction/self-assessment									
Puts at ease and gives general orientation	2.48 (0.74)	2.93 (1.16)	0.44 (1.13)	2.42 (0.95)	2.39 (0.99)	−0.11 (0.75)	0.55	0.17	0.58
Explores feelings/needs and defines learning objectives	2.92 (1.13)	4.19 (0.66)	1.27 (1.05)	2.85 (0.81)	3.45 (0.71)	0.60 (0.93)	0.67	0.002	0.83
Elicits positive and to be improved points	2.04 (1.05) (1.05)	3.49 (0.96)	1.45 (1.22)	1.78 (1.00)	2.30 (1.10)	0.52 (0.92)	0.94	<0.001	0.93
Feedback									
Feedback is descriptive and specific	3.88 (0.55)	4.06 (0.54)	0.18 (0.57)	3.47 (0.67)	3.40 (0.65)	−0.07 (0.54)	0.25	0.02	0.37
Is subjective	3.41 (1.16)	2.76 (1.45)	−0.65 (1.47)	3.02 (1.32)	3.08 (1.08)	0.07 (1.29)	−0.72	0.39	−0.54
Is balanced between reinforcing and corrective statements	3.63 (0.86)	3.82 (0.69)	0.2 (0.93)	3.82 (0.66)	3.73 (0.45)	−0.08 (0.92)	0.28	0.13	0.42
Is limited to a few items	3.71 (0.68)	4.37 (0.56)	0.65 (0.78)	3.47 (0.51)	3.77 (0.69)	0.3 (0.76)	0.35	0.01	0.69
Includes self-assessment points	3.10 (1.24)	4.33 (0.68)	1.23 (1.28)	2.73 (1.05)	3.57 (0.92)	0.83 (1.07)	0.40	0.007	0.38
Solving process									
The supervisor stimulates the learner to make suggestions	2.84 (0.91)	3.93 (0.43)	1.09 (0.73)	2.87 (0.68)	2.97 (0.54)	0.1 (0.61)	0.99	<0.001	1.46
The supervisor uses role playing to test strategies	0.68 (0.71)	2.15 (1.42)	1.47 (1.41)	0.55 (0.73)	0.55 (0.54)	0 (0.68)	1.47	<0.001	2.02
Conclusion									
The supervisor asks to summarize what has been discussed	1.50 (1.05)	3.87 (0.83)	2.37 (1.22)	1.30 (1.10)	1.27 (1.12)	−0.03 (1.06)	2.4	<0.001	2.18
The supervisor checks how it will be done concretely	0.34 (0.63)	1.43 (1.13)	1.09 (1.27)	0.07 (0.18)	0.30 (0.54)	0.23 (0.57)	0.86	0.002	4.94
The supervisor explores how the skills discussed could be used in a different setting	0.06 (0.20)	0.05 (0.17)	−0.01 (0.28)	0.00[a] (0.00)	0.00[a] (0.00)	0.00 (0.00)	−0.01	0.20	−0.08

Table 4 continued

Items	Intervention N = 28			Control N = 20			Delta difference	p	Effect size
	Pre Mean (SD)	Post Mean (SD)	Delta	Pre Mean (SD)	Post Mean (SD)	Delta			
The supervisor discusses a learning plan for the future	0.12 (0.40)	0.23 (0.42)	0.11 (0.45)	0.30 (0.60)	0.27 (0.53)	−0.03 (0.55)	0.14	0.92	0.23
Empathy	4.11 (0.71)	4.61 (0.46)	0.50 (0.72)	4.38 (0.46)	4.23 (0.62)	−0.15 (0.65)	0.65	0.02	1.41
Pedagogical effectiveness	3.18 (0.94)	4.45 (0.55)	1.27 (0.86)	2.88 (0.78)	3.40 (0.74)	0.52 (0.46)	0.75	<0.001	0.96
Structure	3.01 (0.67)	4.13 (0.36)	1.12 (0.54)	2.90 (0.58)	3.05 (0.47)	0.15 (0.56)	0.97	<0.001	1.66
Verbal balance	3.42 (0.95)	4.55 (0.49)	1.12 (0.90)	3.86 (0.91)	3.80 (0.80)	0.02 (0.72)	1.11	<0.001	1.21
Relevance of feedback content	3.70 (0.69)	4.15 (0.42)	0.45 (0.66)	3.50 (0.64)	3.58 (0.58)	0.08 (0.40)	0.37	<0.001	0.58
Global rating	3.45 (0.72)	4.30 (0.28)	0.17 (0.29)	3.40 (0.53)	3.57 (0.42)	0.17 (0.29)	0.68	<0.001	1.29

If Bonferroni correction is applied, p is significant under a value of 0.0025 (0.05/20)

exploring learners' feelings and needs, eliciting positive and to be improved points, stimulating learners' self-assessment, and in overall pedagogical effectiveness.

Discussion

The results of our study show that a clinical supervisors' training program on how to give feedback on residents' communication skills was successful on several levels of Kirkpatrick's evaluation model: it was well appreciated by participants, led to substantial self-perceived positive changes in terms of knowledge and skills and use of teaching methods with moderate to large effect sizes. In addition, and even more important is that this study demonstrated that clinical supervisors improved their feedback skills during OSTEs, i.e. observed changes in behaviors after the training, especially in stimulating self-assessment, making the learner active in finding solution, using role play to test strategies and checking for understanding with large effect sizes.

These results are consistent with other studies showing a positive impact of faculty development programs on teaching skills in clinical practice (Steinert et al. 2006) and are even more robust since we used a pre-post-controlled design, combined self-reported and objective measures of improvement and assessed changes in feedback skills in a detailed way.

The success of this 6-month training in giving feedback on communication skills may be explained by the fact that the training program was based on participants' needs and tailored to working environment specificities (Junod Perron et al. 2009a). It included longitudinal, sequenced and multifaceted learning sessions, and offered opportunities to observe, practice, reflect and receive feedback on skills learned in individual and small group sessions. This is in line with the main principles and instructional methods recommended for effective learning (Salas and Cannon-Bowers 2001) and faculty development programs (Steinert et al. 2006).

Such results may also have been obtained if the teaching focused on other topics such as evidence-base medicine or clinical reasoning since the training program gave much emphasis to the teaching process. However, the fact that clinical supervisors were trained simultaneously in communication and teaching skills may have reinforced the need to pay attention to learner needs, to include learners in the problem-solving process and check the patient/learner understanding since both patient centred and learner centred approaches recommend such strategies (Lacroix and Assal 1998; Marvel 1991; Stewart et al. 2003). This is supported by the fact that the main self-reported and observed changes consisted of making the learner active at any stage of the feedback process (self-assessment, solving process, role playing and conclusion) and that supervisors' talking time decreased. It indicates a clear paradigm shift from a teacher-centred to a more learner centred approach with more attention paid to residents' needs, existing knowledge and skills and capacity to elaborate (Parsell and Bligh 2001; Spencer 2003).

Trained supervisors also reported having improved in other teaching skills such as facilitating small group learning, organising role playing and working with simulated patients. It indicates that through observation and practice, supervisors gained additional teaching tools that could be used in other contexts such as structured teaching sessions on communication skills. Finally, trained clinical supervisors reported discussing and explaining communication skills issues more often than untrained supervisors after the intervention. These self-reported data suggests that some degree of transfer of teaching took place in clinical practice, which should be further assessed objectively in future studies.

However, some elements such as "exploring skill transfer in different situations" and "planning further learning" were hardly ever observed before or after training. It is possible that participants were unable to assimilate all steps and components of feedback in a rather small number of training sessions and retained only what was most meaningful for them. They may also have skipped these last items by lack of time, the feedback being artificially limited to 9 min during the OSTEs.

There was also a parallel trend of improvement in observed feedback skills in the control group, indicating a possible learning effect for the control group. Although it is unlikely, they might have received some other form of training in teaching skills during the intervention period. It is also possible that we raised supervisors' awareness and departmental awareness about the importance of feedback for residents' learning in both the control group and the experimental group because of the pre- and post-measures, which could have led to some small improvements in the control group. However, if this happened, the progression margin would have been even smaller, thus reinforcing our findings.

Main limitations

The study has several limitations. True randomization was not possible inside each setting for different reasons: organizational constraints such as night shift, high turnover of short clinical rotations on different wards in the inpatient setting and small number of potential participants in the outpatient setting due to the small size of the division. Second, there may also have been a selection bias in that only highly motivated clinical supervisors volunteered to take part into the study. Third, the instrument needs further validation. The content validity of the feedback rating scale content was guaranteed by the fact that it was based on theory and reviewed for meaningfulness by a local panel of experts in medical education. However, we did not check for construct-validity. Fourth, we did not explore specifically what opportunities clinical supervisors had during the experimental phase to exercise the teaching skills and do not know if the control group had other learning opportunities. Finally, we did not study whether changes in feedback skills assessed in a simulated environment (OSTEs) led to teaching changes in actual practice.

Further research

The study shows that a training program in giving feedback on communication skills is effective. It does lead to changes in observed behaviors after the training and help clinical supervisors shift from a teacher-centered to a learner-centered paradigm. Further research should focus on which instructional method had the greatest impact and whether improvements in observed teaching skills in a simulated environment lead to improved or more frequent feedback on communication skills in daily practice. It would be of interest to ask residents to evaluate the feedback skills of their supervisors and see whether they report changes.

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