Video-based feedback of oral clinical presentations reduces the anxiety of ICU medical students: a multicentre, prospective, randomized study

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Video-based feedback of oral clinical presentations reduces the anxiety of ICU medical students: a multicentre, prospective, randomized study

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Abstract

Background: Oral presentations of clinical cases by medical students during medical rounds in hospital wards are a source of anxiety and little is known about how this anxiety can be alleviated. The objective of this study was to investigate whether video-based feedback of public oral presentations can reduce anxiety in 4th year medical students.

Methods: Multicentre randomized study conducted in six intensive care units (ICU) and emergency departments (ED) in France over a 9-month period in 2012. One hundred and forty two 4th year medical students were randomized to two groups: intervention and control. Students in the intervention group were recorded while making an oral presentation of a patient during morning ward rounds, followed by video-based feedback. Students in the control group conducted presented classical oral presentations without being filmed and with no formal feedback. Anxiety levels during a public oral presentation were assessed using the Spielberger State Anxiety Inventory (STAI-S). The primary outcome was the difference in STAI-S scores between groups at the beginning and at the end of a 3-month ICU or ED internship.

Results: Seventy four students were randomized to the 'video-based feedback' group and 68 were randomized to the control group. In both groups, STAI-S scores were significantly lower after 3 months of internship. However, the reduction in STAI-S scores was significantly greater in the "video-based feedback" group than in controls (−9.2 ± 9.3 vs. −4.6 ± 8.2, $p = 0.024$. Compared to the control group, significantly fewer students with high-level anxiety were observed in the "video-based feedback" group after 3 months of internship (68 vs. 28%, $p < 0.001$).

Conclusions: Compared to "usual practice", video-assisted oral feedback reduced anxiety and significantly decreased the proportion of students experiencing severe anxiety.

Keywords: Oral feedback, Video tape, Medical education

Background

Oral presentations of clinical cases are performed daily by medical students during medical rounds in hospital wards. Public oral presentations are anxiogenic, particularly when they are associated with direct professional implications. However, the anxiety induced by oral presentations is alleviated only after years of experience, and little is known about how this anxiety can be reduced. Anxiety can have multiple consequences on the student's personal and academic development [1-3]. Medical students [4,5] often report that anxiety increases their feelings of personal inadequacy [6]. Anxiety may also have a negative impact on the quality of the presentation, which may be a source of medical errors and which may affect the patient's outcome [7-9]. It is therefore important to improve communication skills during medical training by ensuring a positive frame of mind.

Video-based feedback is already used in medicine, and good results [10-12] have been obtained in resuscitation of cardiac arrest [11,13] and surgical techniques using video-based feedback [14-16] have been shown to improve the efficacy of simulation-based teaching [17,18].

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Similarly, the oral communication skills of psychiatrists are significantly improved after receiving feedback on their previous videotaped interviews [14-16,19]. Although there is undisputed evidence supporting the efficacy of video-based feedback when teaching clinical skills, the specific value of video-based feedback to reduce the anxiety of medical students has not been previously investigated. We hypothesized that systematic videotape-assisted feedback, as a composite teaching tool, decreases the anxiety of medical students. To test this hypothesis, we evaluated whether the students' anxiety was reduced after receiving feedback from videotaped oral presentations compared with "usual" oral presentations without formal feedback. We also evaluated the students' perceptions of this new educational tool.

Methods

This multicentre, prospective, randomized, controlled study was conducted in six departments (three medical intensive care units (ICU), two surgical ICUs, and one emergency department (ED)) in urban university-affiliated hospitals (Université Paris 6 Pierre et Marie Curie), over a 9-month period in 2012. The protocol was approved by an independent institutional review board ("Comité de Protection des Personnes", Paris Ile de France VI). All participants gave their written informed consent.

Study population

After their first two years in medical school, French medical students spend half of their time in hospital and change wards 3 times a year. During this in-hospital training period, they learn how to examine patients, write medical reports, and apply their theoretical knowledge to various clinical settings. They also attend ward rounds with a senior physician and receive training in general medical practice.

At our university, 4th year medical students must complete a mandatory 3-month training period in an ICU or ED. All students completing a 3-month internship in each participating department (i.e. three 3-month internships) were asked to participate in this study. Foreign-exchange students were not involved, as they follow a different curriculum.

Study design

Eligible students were invited to participate in the study during the first 2 days of their ICU/ED training. Students were informed that the primary objective of the study was to test the impact of VBF on the level of anxiety induced by oral presentation. After being given a brief description of the study and after signing the informed consent form, medical students were asked to fill in an online questionnaire on sociodemographic data and anxiety assessment (see below). The students were then randomized on the same day using the Excel® (Excel 2007, Microsoft) random-number generation function. The medical students were assigned to either the "video-based feedback" (VBF) group or the control group (i.e. with no video feedback). In both arms, students had to perform a formal oral presentation of a patient on a regular basis during morning ward rounds or during handovers. Paper or clinical file supports were available for the student during the presentation. Depending on the group to which the student was randomized, the oral presentation was taped by means of a small portable camera on a mini-tripod (Q3 Handy Video Recorder, Zoom, Japan) or was not taped.

In the VBF group, after completing the ward rounds/handover, a senior physician performed formal feedback on the content and structure of the student's oral presentation, in the presence of all other VBF students at the same centre, but with no students from the control group. Students of the control group were not filmed and did not receive any formal feedback, in line with standard practice in our wards: comments and criticisms of the oral presentation were left to the physician's discretion in each centre. At the end of their training (i.e. 3 months), all students again filled in the same online questionnaire.

Questionnaire content

Sociodemographic data were collected from all students at the beginning of their internship. Anxiety levels were assessed using the validated French version of the Spielberger State Anxiety Inventory (STAI-S) [20]. This score measures the transitional emotional status evoked by a stressful situation, such as an oral presentation, using 20 items each rated by a 4-point Likert scale (possible score range: 20–80). Higher scores are positively correlated with higher levels of anxiety. A score >37 for men and >42 for women reflects high anxiety, and a score >48 for men and >55 for women corresponds to anxiety liable to interfere with performance [21]. The level of anxiety was evaluated in all students at the beginning and at the end of the 3-month emergency room or ICU internship.

All online questionnaires were self-administered by the students. In addition to the STAI-S questionnaire, the students were asked for feedback on their perception and satisfaction with the filmed observation method. The first questionnaire was completed before randomization and on the first day of hospital training.

Endpoints

The primary endpoint was a reduction in the STAI-S score. Secondary endpoints were: 1) the proportion of students with high anxiety and anxiety that might interfere with their oral presentation; and 2) the student's perception of the "educational tool".

Statistical analysis

This study followed CONSORT recommendations for reporting randomized and controlled trials.

Sample size was calculated using the STAI-S value of typical healthy French students [20], which indicated that 141 students were needed to show a 5-point reduction in STAI-S score between the beginning and end of internship, with a power of 80% and a *P*-value of 0.05.

All data distributions were normal according to the Kolmogorov–Smirnov test. The data were therefore expressed as mean ± SD. Continuous variables were compared with Student's t-test, whereas categorical variables were compared with a chi-square test. The primary endpoint (i.e. reduction in the STAI-S) in each group was compared using Student's t-test. The proportion of students with high anxiety and anxiety that might interfere with the oral presentation at the beginning and at the end of the 3-month internship were compared using the paired McNemar test.

All *P* values were two-tailed and $P < 0.05$ was considered significant. Statistical analyses were performed using StatView 5.0 (SAS Institute Inc., Cary, NC) software.

Results

A total of 150 4th year medical students were enrolled in the study over a 9-month period. Two students refused to participate, while 8 students were excluded from the analysis due to insufficient data. Seventy four students were randomized -to the 'video-based feedback' group and 68 four students were randomized to the control group.

Population characteristics

The characteristics and mean pre-intervention STAI-S scores for each group are summarized in Table 1. No significant differences were observed between the two groups. Of note, 44% of all students reported being shy, and 38% reported being anxious during their hospital training. In addition, before randomization, 55% ($n = 79$) of students reported being afraid of speaking in public. Each of the 74 students in the VBF group received a mean of 6 ± 1 VBF sessions devoted to their own performance during the 3-month period: each lasted 16 ± 7 min, while students in the control group did not receive any formal feedback.

Self-assessment of anxiety generated by an oral presentation

Fifty-eight per cent ($n = 82$) of students reported significant anxiety (i.e., STAI-S score >37 for men and >42 for women) during oral presentations at the beginning of their ER or ICU internship: 62% in the VBF group vs. 53% in the control group ($p = 0.26$). In addition, 17% reported that this high level of anxiety interfered with the quality of their oral presentation (Table 1).

Impact of video-based feedback

The STAI-S scores and the numbers of students with major anxiety that could interfere with their performance significantly decreased in both groups by the end of their internship. However, the reduction in the STAI-S score was significantly greater in the VBF group compared to the control group (−9.2 ± 9.3 vs. −4.6 ± 8.2, $p = 0.024$). Similarly, the number of students with high anxiety was

Table 1 Student characteristics and pre-randomisation perceptions of anxiety and public speaking

	Total ($n = 142$)	Control group ($n = 68$)	Video-based feedback group ($n = 74$)	*P*
Age, years	22 ± 1	22 ± 1	22 ± 1	0.61
Male, *n* (%)	45 (32)	24 (35)	21 (29)	0.37
Students' perceptions before randomization, *n* (%):				
"I am shy at hospital"	63 (44)	32 (51)	31 (49)	0.38
"I am anxious during hospital internship"	54 (38)	28 (41)	26 (35)	0.54
"I am afraid to speak in public"	79 (55)	36 (53)	43 (58)	0.38
"I am anxious to be filmed"	99 (70)	49 (72)	50 (67)	0.56
"I fear the criticism of doctors from my department"	93 (65)	41 (60)	52 (70)	0.21
"I fear the criticism of other students"	75 (53)	34 (50)	41 (55)	0.51
Spielberger State Anxiety Inventory (STAI-S) score during an oral presentation before randomization[$]	44 ± 9	42 ± 9	45 ± 9	0.10
- High anxiety*	82 (58)	36 (53)	46 (62)	0.26
- Major anxiety that could interfere with the student's performance**	24 (17)	9 (13)	15 (38)	0.26

[$]Spielberger State Anxiety Inventory (STAI-S), score from 20–80.

*Significantly elevated anxiety is defined as a STAI-S score of >37 for men and >42 for women.

**Anxiety that could interfere with the student's performance was defined as a STAI-S score of >48 for men and >55 for women.

Data are expressed as *n* (%) or mean ± SD.

markedly and significantly lower in the VBF group than in the control group after 3 months of internship (62 vs. 28%, p <0.001) (Figure 1).

Students' perceptions of VBF

Video recording of oral presentations was described as a stressful experience, but, overall, most students in the VBF group reported a favourable memory of the experience (Table 2). Seventy-seven percent of students in the video group reported that this "teaching experience" should be extended to internships in other wards. Similarly, 74% of students in the control group regretted not having received personalized debriefing of their oral presentations. Only two students refused to take part in this study, reflecting the good adherence of the students.

Discussion

This study confirms that oral presentation is a major source of anxiety for medical students. Video-based feedback significantly amplified the anxiety-attenuating effects of repeating public oral presentations and the associated "oral" feedback during a 3-month internship period. It also decreased the proportion of students with anxiety sufficiently severe to impair their performance.

To our knowledge, this is the first study to evaluate the benefit of VBF on anxiety generated by oral presentation during ward rounds. The principle of debriefing is a classical element in project management, sport training, and, more recently, in simulation-based medical teaching [22,23]. Debriefing can focus on positive aspects, can identify failures, and can suggest corrective actions to remedy mistakes made during the presentation. The immediate effect of debriefing immediately after the oral presentation in the presence of other students who can make constructive criticisms is to reduce the accumulated pressure and stress experienced by the student who is being appraised. However, the methods used to conduct feedback are of utmost importance. Empathy during video debriefing is more effective that harsh criticism to avoid demotivating the student and decreasing his/her future performance [5,24]. The students in our study showed good adhesion to these debriefings, as suggested by the significant decrease in anxiety after VBF. The students were also keen to extend this concept to subsequent training sessions (Table 2).

Feedback now appears to be an essential part of medical simulations and education [22,25,26]. Some authors suggest that the addition of video review does not provide any advantages over oral feedback alone [22,27]. However, we believe that VBF increases the didactic impact of the feedback [28,29]. Previous studies in the field of medical education demonstrate that VBF improves efficiency when participants have several opportunities to review their performance [28,29]. Repeated and targeted VBF (mean: 6 ± 1 times) in our study may therefore have contributed to significantly reducing the anxiety of students in the VBF group.

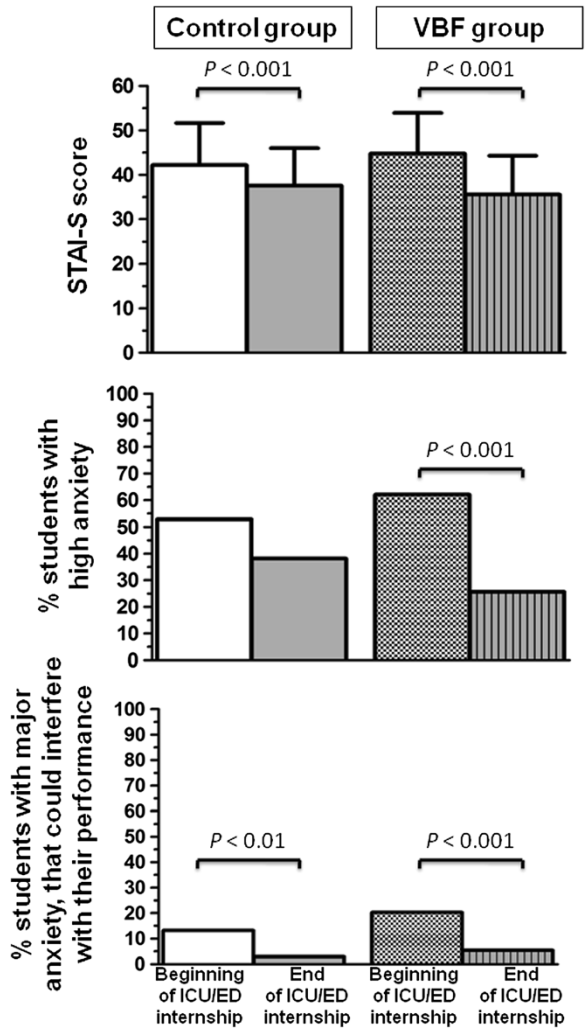

Figure 1 Self-assessment of anxiety generated by oral presentation at the beginning and end of an intensive care unit or emergency department internship. *STAI-S*, Spielberger State Anxiety Inventory: scores from 20–80. The *VBF* group, with video-based feedback; the *control group*, with no video-based feedback; *ICU*, intensive care unit; *ED*, emergency department.

Public oral presentation is difficult and causes high levels of distress to many students. The STAI-S score before randomization was 41 ± 9 for men and 45 ± 9 for women, respectively. In comparison, similar STAI-S scores were found in a French population of patients with burn injuries (42 ± 12 and 45 ± 10 for men and women, respectively) or before a surgical operation (41 ± 9 and 45 ± 8) [20]. In addition, 58% of our students experienced high anxiety levels during an oral presentation at the beginning of their internship, and 17% experience anxiety that was so severe as to interfere with their performance (Table 1).

Table 2 Students' perceptions of video-based feedback

	No	Rather no	Rather yes	Yes
Video-based feedback (VBF) group (*n* = 74)				
"I have a fond memory of the internship"	1 (1)	10 (13)	23 (30)	43 (56)
"This was a weak point of the internship"	65 (84)	11 (14)	1 (2)	0 (0)
"This "experience" has helped me to "generalize"	7 (9)	11 (14)	23 (30)	36 (47)
"This was a stressful time of the internship"	24 (31)	19 (25)	28 (36)	6 (8)
"I'm glad it is over"	18 (23)	32 (41)	21 (27)	6 (8)
No video-based feedback (nVBF) group (*n* = 68)				
"I'm disappointed that I wasn't filmed"	18 (28)	16 (25)	16 (25)	14 (22)
"I'm disappointed that I was not debriefed"	12 (19)	4 (6)	15 (23)	33 (51)
"My oral presentations could have been improved by video-assisted feedback"	9 (14)	3 (5)	30 (47)	22 (34)

Just as a coach teaches athletes how to cope with stress before a competition, senior physicians should try to decrease the anxiety induced by oral presentations. A VBF could help achieve this goal (Figure 1). To the best of our knowledge, no formal training is available to help medical students with oral presentations. We consider this anxiety to be a matter for concern. VBF also generates a positive dynamic within the debriefed group and reduces inter-student resentments [3,30]. Lastly, because anxiety can interfere with performance [31-33], VBF may also have enhanced the quality of oral presentations.

This study has several limitations. Firstly, this study was not designed to demonstrate a specific benefit of the videotaped presentation alone. The study was designed to assess the combined effect of videotaping, formal debriefing and feedback, rather than the sole added value of videotaping. In order to address the specific benefits of video to reduce anxiety, a future study would need to compare formal versus video-assisted oral case presentations, with similar debriefing and feedback in both groups. Secondly, feedback in the control group was not standardized. Because the study was probably the subject of many informal discussions between students, it is possible that even those in the control group received some advice from their fellow students. This possible crossover could partially explain the significant decrease in the STAI-S score after the 3-month period, even in the control group. Thirdly, the higher baseline STAI-S score in the VBF group, although not significant, could partially explain the more marked reduction of the STAI-S score at the end of the study. Lastly, the Hawthorne effect [34], a situation in which the results of an experiment are not caused by experimental factors, but rather because the subjects were aware that they were tested, is an inherent limitation to this type of study and cannot be eliminated.

Conclusions

Oral case presentations by medical students are part of the daily routine in ICUs and ERs, though they can often be stressful. Video-assisted review of oral presentations is simple, not time-consuming, and is very popular. Investment in this educational methodology could reduce major anxiety after only a short period. However, the specific impact of feedback on the quality of the oral presentation needs to be investigated in future studies.

Abbreviations

ED: Emergency department; ICU: Intensive-care units; STAI-S: Spielberger State Anxiety Inventory; VBF: Video-based feedback.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

Conception and design: MS, YF, TS, AD. Acquisition of data: MS, YF, MA, AM, VL, ED, JM, JB. Analysis and interpretation of data: MS, YF, TS, AD. Drafting the article: MS, YF, TS, AD. Revising it critically for important intellectual content: MA, AM, VL, ED, JM, JB, TS, AD. Final approval of the version to be published: MS, YF, MA, AM, VL, ED, JM, JB, TS, AD.

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