Research article

Individual training at the undergraduate level to promote competence in breaking bad news in oncology

Short title: Undergraduate training in breaking bad news in oncology

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Abstract

Objective: Training medical students in breaking bad news (BBN) in oncology may be key to improve patient care in an area where many physicians tend to be uncomfortable. Given the lack of evidence in the literature, this study aimed to assess empirically the impact of two teaching strategies to prepare students for the task of BBN in oncology: one-to-one simulated patient (SP) training with individual feedback (intervention group) vs. small-group SP training with collective feedback (comparison group).

Methods: Fourth-year students (N=236) were randomly assigned to the intervention or comparison group. SP videotaped interviews were analyzed with respect to: BBN communication performance, rated using the Calgary-Cambridge checklist of teaching objectives for BBN; verbal interaction behaviors, coded with the Roter Interaction Analysis System; and seven nonverbal behaviors.

Results: Students in the intervention group scored significantly higher after than before the training on the overall evaluation of the interview ($P < .001$) as well as on process skills ($P < .001$); they also obtained significantly higher scores compared to students in the comparison group on the overall evaluation of the interview ($P < .001$) and on process skills ($P < .001$).

Conclusions: This study supports an individualized BBN teaching strategy, and contributes to efforts to find the best way to train and reach the largest number of future physicians to improve communication competences in oncology.

Keywords: cancer, oncology, Breaking bad news, Communication Skills Training, undergraduate medical education, individual supervision, communication

1. Background

The rationale for training medical students in breaking bad news (BBN) in oncology is based on two main assumptions. First, it provides the opportunity to develop competences of utmost importance, especially emotion-oriented coping (bad news) and medical problem-oriented coping (complex information), useful and applicable far beyond this specific task. Second, it is well established that physicians tend to feel insecure and report a lack of training in BBN, so that starting with communication education at the undergraduate level may be key to improve the situation [1-4]. Introducing BBN training at the undergraduate level also makes it possible to reach all medical students regardless of their future medical specialty; post-graduate BBN training is usually targeted to oncologists, even if general practitioners see many cancer patients. Moreover, the fact that oncological situations call for shared decision-making, which is a component of patient-centered care, and respect of medical-legal and ethical issues (informed consent, patient autonomy) make them particularly interesting for Communication Skills Training (CST) [5,6].

BBN in oncology is a difficult task for medical students – and for experienced physicians as well – because it is emotionally and relationally very demanding and requires opening up and gaining awareness of one's own reaction and inner world [7,4]. Level of stress and subsequent distress are highly individual, depending on both the task being performed and the anxiety induced by the task [8,9]. These psychological aspects call for a reflexive and supportive pedagogic approach, ideally centered on the individual needs of the student. In this respect, individual supervision may constitute a secure environment to debrief and to provide constructive feedback after having performed a BBN task. In our experience, BBN training matches well with the teaching objectives of the second part of medical studies (Master's degree level) when basic elements of physician-patient encounter have already been trained.

Research shows that preparing medical students for the task of BBN by having them practice can improve their competences as well as their self-confidence [3,10-13]. Strategies for teaching BBN include notably lectures, small-group discussions, role-playing with peers, and encounters with simulated patients (SP) (in small groups or in one-to-one teaching) [3,11,14]. These approaches differ in their advantages and limitations, but also in the students' *opportunity to practice* the skills and to receive *feedback* on their performance, the two core components of effective training [15-18]. While lectures and small-group discussions offer no chance of experiential-based learning and therefore have limited effect with respect to skills improvement, role-plays and SP encounters are typically centered around providing opportunities for practicing and receiving feedback either from the SP (actor), peers, senior physicians, or faculty members [3,10-12,19]. In comparison with small-group settings, one-to-one SP interviews diminish the discomfort that students may experience when performing in front of their peers and faculty members and ensure a more realistic encounter.

One-to-one SP training with individual feedback seems intuitively more efficient than small-group SP training with collective feedback. However, to the best of our knowledge, this has never been tested empirically and especially not in the realm of BBN in oncology. The noteworthy cost difference in time, effort and faculty resources between these two teaching strategies makes it important to assess their respective impact.

The aim of the present study was thus to compare one-to-one SP training and individual supervision with small-group SP training and collective supervision as part of an undergraduate CST program in BBN in oncology. We hypothesized that (i) medical students benefiting from the individualized training approach (intervention group) would increase their communication performance in BBN post-training, and (ii) they will perform significantly better in post-training interviews than students with small-group training (comparison group).

2. **Methods**

2.1 Procedure and design

Participants were 239 fourth-year (Master's degree level) medical students at Lausanne University Medical School (Switzerland) who participated in a CST program in BBN between 2012 and 2014; this program is part of the larger communication curriculum developed in our University [20]. In this training program, students are given the opportunity to conduct a 20-min interview with a SP, in this case professional and experienced actors recruited by the Medical Education Unit of our University, participating in the SP program for several years, and trained to portray a patient in a standardized way; 28 different SPs were involved in the study. The interviews were based on a single vignette featuring a medical intern in oncology delivering the bad news of a palliative situation to a male or a female middle-aged patient with a gastric cancer who had recently undergone partial tumorectomy. The goal of the interview was to inform the patient about the palliative situation, treatment options (palliative chemotherapy or no treatment), and prognosis.

Only three out of 239 students did not complete the training program until the end, so the final sample is composed of 236 students (57% female), mean age 23 ± 1 year. The students were randomly assigned to one of two conditions: 96 students (54% female) were assigned to the intervention group and 140 (59% female) to the comparison group.

In the intervention group, each student conducted two videotaped interviews with a SP (two training sessions with an interval of six weeks); after each session the student had a 60-min individual supervision by a faculty tutor. All tutors (N=8) were involved in the basic course in clinical communication for second-year medical students (Calgary-Cambridge framework [21]) and had extensive experience in clinical supervision; their professional background is clinical psychology or psychiatry. Moreover, they attended a 'train-the-trainer' course based on videotaped BBN interviews of students and SPs, focusing on the feedback

that would be given to the student on core components of the BBN task: communication techniques, information provision, and emotion handling. Tutors' approach was supportive and student-centered; mirroring what was expected from the student towards its patient. Students in the comparison group followed the standard curriculum in BBN at our Medical School, which consists of two teaching sessions in small groups (12 students) with one student per session conducting a videotaped interview with a SP, which is observed by the other students and discussed collectively – 90-min feedback – with the faculty (AB or FS).

All students in both groups (intervention and comparison) conducted a post-training videotaped BBN interview with a SP. The dataset therefore included pre- and post-training interviews of all students in the intervention group (allowing for within-group comparisons, before and after training) and post-training interviews of all students in the comparison group (allowing for between-group comparisons after training). For all videotaped interviews, communication performance in BBN as well as verbal and nonverbal communication behaviors were measured.

Although there is more to the task of BBN than how and what the physician tells the patient (e.g., when and where the news is communicated), we focus on the communication aspect, and especially on verbal and nonverbal behavior [22] of the medical students. As already mentioned BBN is an emotionally intense situation which is reflected by verbal and nonverbal behavior.

2.2 Measures

2.2.1 *BBN communication performance*

The BBN communication performance of the medical students was rated using the checklist of teaching objectives based on the methodology developed and validated within the Calgary-Cambridge framework for BBN Objective Structured Clinical Examination (OSCE) [21: OSCE station: Breaking Bad News]. We used the overall impression item and the process

skills grid of the Calgary-Cambridge BBN checklist. The overall impression item is a global rating of the interview on a scale from 1 (very bad overall impression/clear fail) to 5 (very good overall impression/excellent pass). The process skills grid includes 17 items rated on three levels (0 = not done/inadequate, 1 = adequate, 2 = good). Examples of process skills are: the student "assesses the patient's starting point", "gives clear signposting that serious important information is to follow", "gives explanation in an organized manner", "encourages patient to contribute reactions, concerns and feelings", or "provides support (e.g. expresses concern, understanding, willingness to help)". Rating was performed by a trained coder blind to the training condition and time of videotaping (pre- vs. post-training). A random sample of interviews (n=44, 12%) was double-coded by a second blind coder to establish interrater reliability with regard to the overall impression of the interview (r = .72). Process skills items were summed to calculate total scores[1].

2.2.2 *Verbal interaction behavior*

Verbal behavior during the videotaped interviews was coded for both the student and the patient with the Roter Interaction Analysis System (RIAS) [23]. The RIAS is a widely used coding system for describing clinical communication and has been utilized in various oncology settings [24-26]. The RIAS provides a framework of 37 mutually exclusive categories of communication to which patients' and clinicians' utterances are assigned and that reflect the content and form of the communication. All interviews were analyzed by trained and certified RIAS coders blind to the group condition and time of interview.

To reduce the number of categories into meaningful clusters, we used the 12-cluster system proposed by Ford et al. for a BBN setting in oncology [24]: (1) Social talk, (2) Positive talk, (3) Negative talk, (4) Emotional responsiveness, (5) Partnership building, (6) Orientation, (7) Open questions, (8) Closed question, (9) Biomedical info, (10) Psychosocial

[1] Note that process skills and overall performance impression have been originally conceived as independent ratings, but they nevertheless correlate with each other in our data set (r = .83 at pre- and .87 at post-training).

info, (11) Biomedical counseling, and (12) Psychosocial counseling. Appendix 1 shows the coding categories included in each cluster. Most of the clusters contain clinician and patient verbal behaviors, while some contain only clinician verbal behavior. This clustering system was chosen because it was already used in a BBN setting and because it captures the interactive nature of the interview.

2.2.3 *Student nonverbal communication behavior*

We focus on behaviors that have been defined as being important in a BBN setting [27]. These include nonverbal behaviors that communicate warmth, empathy, encouragement, and reassurance. We therefore measured nodding, gazing, nonverbal empathy, adaptability of speech rhythm, and cautiousness of voice tone, as well as signs of nonverbal stress and carelessness of voice tone (the latter two are reversed coded). Three external coders also blind to the group condition and time of interview coded these seven nonverbal behaviors of the medical students. For nodding, we assessed the number of nods shown by the student during the interaction divided by the total duration of the interaction. For the other 6 behaviors, a global coding of the entire interaction was done on a 10 point Likert scale (1 = not at all, 10 = very much so). With one exception (empathy), interrater reliability of the coding was done on 10 randomly chosen videos coded by two judges (all *r*'s between .62 and .87); because nonverbal empathy was coded as a broad and global impression, for this behavior all videos were viewed by three coders and ratings averaged (Cronbach's alpha = .66). We aggregated the aforementioned behaviors in order to create a cluster of positive student nonverbal behavior (Cronbach's alpha = .62 at pre- and .67 at post-training). Note that nonverbal stress and carelessness of voice tone were reversed before aggregating.

3. Results

A paired sample *t*-test comparing pre- and post-training performance of the students in the intervention group confirms the hypothesis that they scored significantly higher on the overall evaluation of the interview after the training (M = 3.67, SD = 0.96) than before the training (M = 3.03, SD = 0.93), $t(95) = 5.83$, $p < .001$. This is also true for the process skills with students in the intervention group having significantly higher scores after the training (M = 23.56, SD = 4.97) than before the training (M = 14.88, SD = 4.95), $t(95) = 16.73$, $p < .001$.

An independent sample *t*-test comparing performance variables of the post-training interviews confirms the second hypothesis that students in the intervention group obtained significantly higher scores on the overall evaluation of the interview (M = 3.67, SD = 0.96) than students in the comparison group (M = 3.05, SD = 0.88), $t(234) = 5.09$, $p < .001$. Similarly, students in the intervention group scored significantly higher on the process skills items (M = 23.56, SD = 4.97) compared to students in the comparison group (M = 19.99, SD = 5.06), $t(234) = 5.36$, $p < .001$.

In order to explore which behavioral changes between the pre- and the post-training interviews were related to an increase in performance in the intervention group, we computed measures of behavioral change by subtracting how much a specific behavior cluster was shown at pre-training from that same behavior at post-training. Higher scores thus mean an increase in the particular behavior cluster from pre- to post-training. We entered these change variables in two regression models (one for verbal interaction clusters and one for the nonverbal behavior cluster) to predict post-training interview communication performance in BBN (while controlling for student gender). Table 1 displays the results of this regression analysis. Results show that a better post-training overall impression of the interview in the intervention group after training was related to an increase in positive talk, partnership building, and psychosocial information provision from pre- to post-training. Results for the

intervention group also show that a better post-training overall impression of the interview was related to a decrease in social talk between pre- and post-training. However, there were no significant correlations between process skills scores and changes in verbal interaction behaviors between pre- and post-training interviews.

For the nonverbal behaviors, Table 1 shows that a better overall impression of the interview as well as a better score for process skills were both related to an increase in positive nonverbal behavior between pre- and post-training of students in the intervention group.

Note that analyses were also run for male and female separately. It yielded no differences for the t-tests. Both male and female students of the intervention group performed significantly better after the training (compared to before the training) and had better scores after the training compared to the comparison group. The regressions relating students' scores from their behavioral changes could not be interpreted for female and male separately, because of the lowered sample-size (all tests of overall significance of the models drop to non-significance). Nevertheless, these models indicated no evident gender differences.

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4. Conclusions

The evaluation of the impact of one-to-one SP BBN training completed by an individualized supervision clearly shows an improvement of medical students' post-training competence; these students also perform significantly better than comparison students trained in small-group sessions. This improvement seems to go beyond the acquisition of purely technical skills. Students in the intervention group indeed demonstrated positive changes in communication as well as humanistic behaviors, such as expressing empathy, providing

support or acknowledging patient concerns and feelings. Correlates of the changes in competence were also identified at a more micro level with the analysis of verbal and nonverbal behaviors of students.

Until now, only a limited number of studies have compared or assessed strategies for teaching BBN and they mainly focused on the impact on trainees (e.g., their satisfaction or confidence with specific models or protocols for BBN) rather than on performance and behavioral changes [3,10-13].

Besides demonstrating the feasibility and effectiveness of a CST program in BBN for medical students, this study addressed an important issue regarding strategies for teaching BBN at the undergraduate level and provides empirical findings supporting the individualized strategy rather than the more common small-group teaching; a combination of these concurrent approaches may also be taken into consideration, and they should not be seen as mutually exclusive. The higher cost of the one-to-one SP training and supervision program for BBN in terms of available faculty, SPs, and curricular time allocations appears to be worth it given the significant impact on students' performance. Research tends to point in the same direction, revealing that trainees desire both more training opportunities and the possibility to practice with SPs [11,28]. In a previous study, we also showed that compared to observing students (those who did not conduct SP interviews in small-group sessions), only students conducting an interview felt they could reach the training objectives [20].

These findings also have implications with regard to oncologists' postgraduate training in communication. Based on the experience with mandatory CST for oncologists in Switzerland [29], we indeed observed major benefits of individual supervision following training. These supervisions serve to address oncologists' intrapsychic and contextual pressures [30,31], and to adjust the training to their specific needs.

Individual supervision is thus unique in allowing fine tuning to the specific abilities, difficulties and needs revealed through the complex task and enriching experience of BBN. Among the advantages of training in BBN as part of the undergraduate medical education, two additional points should be addressed. First, the videotaped interviews and student-centered individual supervisions could be viewed as providing, as suggested by the results of this study, key *teachable moments* for the students, which ultimately impact their behavior and prepare them for the encounter with patients in the context of clinical practice [11]. Second, periodic *booster sessions*, which would ideally allow to reinforce performance and competence development throughout medical education, seem to be a promising strategy to enhance the impact of CST for medical students [5,21].

Finally, it has to be remembered that many cancer patients are not only treated by oncologists. General practitioners, gynecologists and other specialists are often part of the treatment. Training at the undergraduate level of these future specialists is therefore also a mean to enhance the understanding of the communication challenges entailed in the care of this patient population for clinicians who will not enter specific training programs as do the oncologists. This last point is even more important considering the well-known fact that patient-centeredness and empathy decrease with the immersion of students into clinics [32,33]. Undergraduate training might have a "preventive effect" by targeting a period where the medical students are not yet influenced by the medical context. One of the major challenges of training, and especially with regard to training in communication, is the question of how to guarantee an enduring effect. The literature on CST in oncology is up to now unable to answer this question [34,35] and there is an obvious lack of follow-up studies assessing outcomes of such training [5]. Nevertheless, the more early in the career – such as proposed here –, the more occasions to train, the more chances to get long-lasting effects.

4.1 Limitations of the study

We see a potential limitation concerning the implementation of our results in Medical Schools for economic reasons. As mentioned earlier, the one-to-one SP training with individual supervision is cost- and time-intensive. However, cost and time investment have to be evaluated in light of the importance of physician communication training – not only in BBN – and the learning potential of BBN training for other situations of clinical communication; Lausanne University Medical School has thus made the decision to adopt the "one-to-one SP training with individual feedback" teaching strategy for all fourth-year medical students (about 200 students per year) since 2014.

4.2 Practice implications

It is not only feasible, but it may be very profitable to train and improve performance in BBN at the undergraduate level insofar as cancer patients will eventually meet practitioners better trained to deliver bad news. The present results contribute to efforts to find the best way to train and reach the largest number of future physicians to increase awareness as well as communication competence in BBN in the specific and important area of oncology, a major educational challenge.

Ethical approval

The study protocol was approved by the Human Research Ethics Committee of Lausanne University Hospital (protocol number: 358/12).

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Disclosure

The authors have declared no conflicts of interest.

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Table 1. *Linear regression models predicting post-training performance of the intervention group students from increases (between pre- and post-training) in verbal and nonverbal behavior*

	Overall impression		Process Skills	
Variables	*B*	SE	*B*	SE
Increase in verbal interaction behavior				
Social talk	-0.37*	0.15	-1.44†	0.80
Positive talk	0.05*	0.02	0.20†	0.10
Negative talk	0.03	0.10	-0.21	0.55
Emotional responsiveness	0.02	0.02	0.14	0.11
Partnership building	0.06*	0.03	0.18	0.14
Orientation	0.03	0.08	0.25	0.43
Open questions	0.01	0.03	-0.08	0.16
Closed questions	-0.08	0.05	0.02	0.29
Biomedical info	0.04	0.03	0.25	0.15
Psychosocial info	0.06*	0.03	0.23†	0.14
Biomedical counseling	0.05	0.05	0.13	0.27
Psychosocial counseling	0.02	0.03	0.10	0.15
F	2.37**		1.57	
R2	.29		.21	
Increase in student positive nonverbal behavior	0.29*	0.14	1.47*	0.72
F	3.85*		4.49**	
R2	.11		.13	

†$p < .10$.*$p < .05$. **$p < .01$. ***$p < .001$. $N = 96$.

Note. Students' gender has been entered as covariate in the 2 regression models.

Appendix 1. Verbal Clusters with Corresponding RIAS Categories

Social talk	
	Social conversation and non-medical exchange
	Patient and clinician
Positive talk	
	Laughter, agreements, approval, and compliments
	Patient and clinician
Negative talk	
	Disagreements and criticisms
	Patient and clinician
Emotional responsiveness	
	Concern and reassurance/optimism, empathy, and legitimization
	Patient and clinician
Partnership building	
	Asking for opinion, understanding, paraphrasing, interpretation
	Clinician only
Orientation	
	Direct instructions and setting the agenda of the visit
	Clinician only
Open questions	
	Across medical, treatment, psychosocial, and lifestyle issues
	Patient[a] and clinician
Closed question	
	Across medical, treatment, psychosocial, and lifestyle issues
	Clinician only
Biomedical info	
	Information related to medical condition, treatment, and side effects
	Patient and clinician
Psychosocial info	
	Information related to emotional issues and lifestyle
	Patient and clinician
Biomedical counseling	
	Persuasive attempts related to medical condition and treatment
	Clinician only
Psychosocial counseling	
	Persuasive attempts related to emotional issues and lifestyle
	Clinician only

[a] all patient questions are treated as open