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**Authors:** Carrard V, Bourquin C, Stiefel F, Schmid Mast M, Berney A

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**Title**

Undergraduate Training in Breaking Bad News: A Continuation Study Exploring the Patient Perspective

**Running Title**

Patient Perspective on an Undergraduate Training in Breaking Bad News

**Authors**

Valerie Carrard [†co], Céline Bourquin [†co], Friedrich Stiefel [†], Marianne Schmid Mast [‡], & Alexandre Berney [†]

[†] Psychiatric Liaison Service, Lausanne University Hospital (CHUV), Switzerland

[‡] Department of Organizational Behavior, University of Lausanne, Switzerland

[co] These authors contributed equally to the present study and are both considered first authors

**Corresponding Author**

Alexandre Berney, Psychiatric Liaison Service, Lausanne University Hospital (CHUV), Avenue de Beaumont 23, 1011 Lausanne, Switzerland.

Tel.: +41 21 314 1105. E-mail: alexandre.berney@chuv.ch

**Keywords**

Cancer, Oncology, Breaking bad news, Communication training, Medical students, Patient outcome

## Abstract

**Objective**. This paper reports on the continuation of an initial study that demonstrated effectiveness as rated by experts of an undergraduate training in breaking bad news (BBN) using simulated patient (SP) and individual feedback. The current study aimed to further explore whether such an individualized training approach has also positive effects from the perspective of the patient, using the analogue patient methodology.

**Methods**. A subsample of 180 videotaped interviews were selected from the existing dataset ($N$ = 332), consisting of 60 pre- and post-training interviews of students benefiting from the individualized approach (intervention group) and 60 post-training interviews of students having small-group SP training and collective supervision (comparison group). Sixty-eight analogue patients (APs) – healthy untrained observers – were asked to view the videotaped interviews while "putting themselves in the patient's shoes" and evaluate satisfaction, trust, liking, and competence of medical students.

**Results**. Students in the intervention group improved significantly from pre- to post-training on several dimensions evaluated by the APs: patient satisfaction, trust in physician, liking of physician, and perceived medical competence. Increased AP satisfaction was related to different changes in students' communication behavior between pre- and post-training: increase in positive talk, emotional responsiveness, biomedical and psychosocial information, and biomedical counseling. There was no significant difference between the intervention and the comparison group at post training for AP evaluation.

**Conclusions**. This investigation provides additional and complementary evidence of positive effects of an individualized training in BBN from the perspective of APs, a proxy of (real) patients.

## Background

Communicating bad news to patients is a challenging task in today's medical practice that has an impact on the deliverers and the recipients.[1–4] In training, this task is of great pedagogical value, because breaking bad news (BBN) includes informing patients about complex and threatening medical issues and handling emotions generated by the information on both the physician and patient side.[5–7] Communication training during the formative years of undergraduate medical education may, in that respect, be a way to alleviate difficulties faced by physicians, and benefit them as well as their patients.[8]

This paper is the continuation of an initial study,[9] which compared the effect of two teaching formats in an undergraduate BBN communication course for medical students. Based on expert evaluation, the initial study demonstrated that students benefiting from one-to-one training with simulated patients (SPs), supplemented by an individualized supervision, substantially improved their communication competence after training. Moreover, these students performed significantly better than comparison group students trained in small-group sessions.[9] Since understanding how patients assess and react to the behavioral styles of health care professionals is of utmost importance in clinical communication research, the present study aimed to further explore and gain insights into *the perspective of patients* on this individualized approach of teaching.

The relatively sparse literature on the topic suggests that incorporating the patient perspective into communication training assessment is still an unusual step.[10,11] The patient perspective may be difficult to gain access to and this is particularly true in undergraduate education. The use of the analogue patient (AP) methodology is a validated and reliable alternative in such situations when access to perceptions of the original or real patients is impractical or impossible.[12–14] APs are healthy untrained subjects, who are asked to put themselves “in a patient’s shoes” while viewing and rating a medical interaction. The present

continuation study aimed to shed light on whether the individualized BBN training format has also positive effects when exploring the perspective of patients using this AP methodology.

## Methods

The present study is based on AP evaluation of a subsample of existing data collected during the above-mentioned initial study[9], which applied a randomized pre-post intervention design with comparison group.

### Existing Dataset

The dataset (videos and coding) from the initial study is described in details elsewhere.[7,9] In short, 236 fourth-year medical students of Lausanne University Medical School (Switzerland) participating in a BBN course were randomly assigned to one out of two conditions: intervention or comparison group. Students in the intervention group conducted two 20-minutes videotaped interviews with an SP, followed each time by a 60-min individual supervision with a faculty tutor. Students in the comparison group followed the standard curriculum consisting of two 120-min teaching sessions in small groups (12 students). All interviews were based on the same vignette: a resident in oncology delivers the bad news of a palliative situation to a middle-aged patient with a gastric cancer. Students in both groups conducted a post-training videotaped BBN interview with an SP. Thus, as depicted in Figure 1, the existing dataset includes pre- and post-training interviews of the students in the intervention group and post-training interviews of the comparison group students.

Several coding carried on for the initial study have been used in the present study. First, coders blind to the training condition and time of videotaping rated the medical students' verbal and nonverbal behaviors (described in Table 1). Second, the medical students performance was evaluated by communication experts using the teaching objectives checklist developed and validated within the Calgary-Cambridge framework for BBN Objective Structured Clinical Examination (OSCE[15]). In the present study, we report the results from the

OSCE's *overall impression* rated on a scale ranging from 1 (very bad overall impression/clear fail) to 5 (very good overall impression/excellent pass) obtained in the selected subsample.

**Data selection**

For the current continuation study, a subsample of 120 students was selected from the existing data. As depicted in Figure 1, 30 male and 30 female students from the intervention group were randomly selected, as well as 30 male and 30 female students from the comparison group. All in all, the data for the present study comprised 180 videotaped interviews: 120 videos of 60 intervention group students (pre- and post-training interviews) and 60 videos of 60 comparison group students (only post-training interviews).

**Participants**

In total, 68 APs (41 females and 27 males) from the general population were recruited through web advertisements in our hospital intranet and its LinkedIn page. Exclusion criteria were being younger than 18 years old, not being fluent in French, and ever having been diagnosed with cancer. The recruited APs presented a wide age range ($M$ = 34.94; range = 19-59) and educational background (around 50% university degree and 50% vocational training degree). They were compensated with the Swiss equivalent of 300$ for their participation.

**Procedure**

The recruitment of the APs started in September 2017 and the last data collection session took place in December 2017. After signing an informed consent form and a nondisclosure agreement, each participating AP viewed 15 randomly assigned videos of BBN interviews, but never viewed two interviews of the same medical student. The viewing and evaluation of the videos were realized in three sessions (5 videos per session), which each lasted 3 hours maximum and took place on different days. In accordance with other APs study procedures,[12,13] we instructed the participants to put themselves "in the shoes of the patient" while viewing and evaluating the videotaped interviews.

**Measures**

The APs were blind to the training condition and time of videotaping (pre- vs post-training). They evaluated the medical students' interviews on several variables commonly used when exploring the perspective of patients:[16] patient satisfaction with the consultation, trust in the physician, liking of the physician, and evaluation of the physician's competence. Three satisfaction measures were included. The first is an *overall impression* single item, which is an adaptation of the OSCE's overall impression rated by the experts in the initial study.[9,15] The second is a *general satisfaction* questionnaire used in previous AP studies (4 items; Cronbach's α = .97).[13] The third, the *Princess Margaret Hospital Satisfaction with Doctor Questionnaire (PSQ-MD),* is a multi-dimensional questionnaire (29 items; Cronbach's α = .96) encompassing satisfaction with "information exchange" (10 items; Cronbach's α = .91), "interpersonal skills" (8 items; Cronbach's α = .85), "empathy" (6 items; Cronbach's α = .90), and "quality of time" (5 items; Cronbach's α = .77).[17,18] *Trust* in the physician is a very common variable in clinical communication studies, but few empirically validated short questionnaires exist.[19] Trust was thus assessed with 3 items used in other studies and showing good reliability (Cronbach's α = .91).[20–22] Measuring *liking* is less common, but the liking item selected for the present study ("All in all, I like this doctor a lot") is the most frequently used when it comes to obtain an affective evaluation of a physician.[14,23] Finally, c*ompetence* was measured with a questionnaire that showed good reliability in previous studies (7 items; Cronbach's α = .94) and assesses two distinct dimensions: medical competence (4 items; Cronbach's α = .94) and interpersonal competence (3 items; Cronbach's α = .90).[20,24] All items were evaluated on a scale of 1 ("completely disagree") to 5 ("completely agree"), except for the PSQ-MD's items, which were evaluated on a scale of 1 ("completely disagree") to 4 ("completely agree").

Based on the AP methodology literature recommendations,[13] each video was evaluated by five APs in order to obtain a reliable evaluation. The evaluation of the different APs was thus averaged for each video and Intra-Class Correlations (ICC) showed good inter-rater reliability with one-way average ICCs ranging from .48 to .64.[25,26]

**Statistical analysis**

Paired sample *t*-tests were used to determine whether medical students in the intervention group were evaluated more positively by the APs at post-training (compared to pre-training). Independent sample *t*-tests were run to determine whether medical students in the intervention group were evaluated more positively by the APs than medical students in the comparison group (both at post-training).

To better understand the patient perspective regarding communication behaviors, we tested whether specific changes in behavior between pre- and post-training triggered more positive APs evaluation at post-training. Based on the behavioral coding from the existing dataset (described in Table 1), we computed behavioral change scores between pre- and post-training for both verbal and nonverbal behaviors of the students in the intervention group. Using regression analyses, we tested how these behavioral change scores (independent variables) are related to the variables evaluated by the APs (dependent variables).

As attentiveness may vary depending on the session, AP identification with, immersion in, and attention to the videos were assessed using the Video Engagement Scale.[27] A repeated measures ANOVA showed that the APs were significantly less immerged during the third session ($M$ = 3.72; $SD$ = 0.55) as compared to the first ($M$ = 3.94; $SD$ = 0.43) and second session ($M$ = 3.92; $SD$ = 0.53); $F(1.91, 122.15) = 12.22$, $p < .001$. However, when controlling for the number of days between the first and last session ($M$ = 22.25, range = 2-65), this difference becomes non-significant. *Number of days between the first and last session* was thus included as a control variable along with APs' *gender*, *age*, and *education*.

Additionally, the *gender* and *cohort* (2012 or 2013) of the medical students were included as control variables.

## Results

We first checked whether the subsample selected for this study was comparable to the entire dataset with respect to the expert evaluation collected during the initial study. Re-running the analyses based on expert evaluation led to similar results as in the whole sample with a significant improvement from pre- to post-training in the intervention group as well as significantly higher performance post training in the intervention group than in the comparison group (see last row of Table 2).

Paired sample *t*-tests showed that the medical students in the intervention group improved significantly from pre- to post-training on almost all the variables evaluated by the APs (see Table 2). APs were significantly more satisfied with the interviews after the training with respect to *overall impression, general satisfaction*, and *PSQ-MD*. Similarly, APs' evaluation of *trust in the student* and *liking of the student* significantly improved from pre- to post-training. For the perceived competence of the students, APs evaluation of *medical competence* significantly improved from pre- to post-training, but there was no significant difference for *interpersonal competence* between pre- and post-training.

In contrast to our previous findings with expert evaluation, there was no significant differences between intervention and comparison group at post training for AP evaluation (see Table 2).

Results of linear regression models testing the link between medical students' change in behaviors from pre- to post-training and the AP evaluation are displayed in Table 3. Results indicate that increases between pre- and post-training of *positive talk, emotional responsiveness, biomedical information, psychosocial information*, and *biomedical counseling* are significantly related to more positive AP evaluation on all the variables measured.

Concerning effect sizes, the $R^2$ ranging from .42 to .54 indicate large effects for the verbal behaviors models and explain around 50% of the variance in AP evaluation.[28]

## Discussion

The present investigation showed that medical students participating in BBN training with SP and individual feedback improved significantly on several dimensions evaluated by analogue patients: *satisfaction with physician*, *trust in physician*, *liking of physician*, and *medical competence*. This continuation study complements and strengthens the results obtained with expert evaluation by providing an additional perspective, which likewise supports the beneficial effect of our undergraduate training. It is interesting to note that the AP methodology has so far been primarily applied to assess communication behaviors of clinicians regardless of a specific training. It has been used to examine the effectiveness of communication training in only a very limited extent, be they in under- or in postgraduate medical education.[12,29]

In contrast to evaluation by experts, evaluation by the APs at post-training did not significantly differ between intervention and comparison group, the later corresponding to a group training. In this regard, it has to be pointed out that students in the comparison group also benefitted from a training and differences between the two groups, if any, are expected to be small. These differences might thus be too small to be perceived by the APs' untrained eye, whereas expert viewers perceive the performance of intervention group students as being higher compared to the comparison group students. Another possible interpretation is that the type of training does not really make a difference for the APs. An alternate explanation relates to the type of instrument used by experts and APs, which differs. Nevertheless, our results suggest that both formats of training tend to benefit the students from the AP perspective.

When comparing our results with those of the initial study,[9] we observe that the behaviors linked to positive evaluation by experts and APs only partially overlap. Some

behavioral changes (from pre- to post-training) are related to better evaluation of both experts and APs (*positive talk* and *psychosocial information*), whereas others are linked only to expert evaluation (*social talk* and *partnership building*) or only to AP evaluation (*emotional responsiveness*, *biomedical information*, and *biomedical counseling*). Nonetheless, the evaluation of experts and APs relate both on technical as well as relational communication behaviors.

**Study Limitations**

This study has limitations. First, AP evaluation has been showed to be a reliable surrogate of patient evaluation,[13] but it is still a proxy of what a real patient may experience during an encounter. However, because oncological BBN with real patients is ethically hardly feasible or desirable at an undergraduate level, AP evaluation remains the most adapted methodology to acquire the patient perspective for the here-investigated training. Second, we do not know through our study what component of the training is most effective, e.g., repetition of the videotaped encounter or supervision. Finally, the present evaluation of BBN training was short-term, a longitudinal follow-up would enable to evaluate long-term impact and maintenance of the competences acquired in the training.

**Clinical Implications**

This study provides empirical support fostering the implementation of BBN communication training at the undergraduate level, because it seems beneficial from both expert and AP perspectives. The use of an oncological BBN vignette suits perfectly such training as it challenges medical students with respect to information giving and emotion handling. Furthermore, it is important to prepare students, who – whatever their future specialization –, will typically be involved, in one way or another, in the care of cancer patients. Ultimately, as for any training in clinical communication, the purpose is that

physicians are able to adequately communicate or relate to their patients. These key elements can be effectively explored with the AP methodology.

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## Conflict of Interest Statement

The authors declare no conflicts of interest.

## Ethical Background

The protocol of the initial study was approved by the Human Research Ethics Committee of Lausanne University Hospital (protocol number: 358/12). The present continuation study was deemed out of the scope of the Swiss Human Research Act and does therefore not require ethical approval in Switzerland (Human Research Ethics Committee of Lausanne University Hospital, protocol number: 2017-00123).

## Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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# Tables

## Table 1

*Behaviors Coded in the Initial Dataset*

| Behaviors | Description | Patient | Clinician |
|---|---|---|---|
| Verbal behaviors 12-clusters† | | | |
| Social Talk | Social conversation and non-medical exchange | x | x |
| Positive talk | Laughter, agreements, approval, and compliments | x | x |
| Negative talk | Disagreements and criticisms | x | x |
| Emotional responsiveness | Concern and reassurance/optimism, empathy, and legitimization | x | x |
| Partnership building | Asking for opinion, understanding, paraphrasing, interpretation | | x |
| Orientation | Direct instructions and setting the agenda of the visit | | x |
| Open questions | Across medical, treatment, psychosocial, and lifestyle issues | x | x |
| Closed question | Across medical, treatment, psychosocial, and lifestyle issues | | x |
| Biomedical info | Information related to medical condition, treatment, and side effects | x | x |
| Psychosocial info | Information related to emotional issues and lifestyle | x | x |
| Biomedical counseling | Persuasive attempts related to medical condition and treatment | | x |
| Psychosocial counseling | Persuasive attempts related to emotional issues and lifestyle | | x |
| Nonverbal behaviors aggregated‡ | | | |
| Nodding | number of nods divided by the interview duration | | x |
| Gazing at the patient | general impression from 1 (“not at all displayed”) to 10 (“very much displayed”) | | x |
| Nonverbal empathy | general impression from 1 (“not at all displayed”) to 10 (“very much displayed”) | | x |
| Adapted speech rhythm | general impression from 1 (“not at all displayed”) to 10 (“very much displayed”) | | x |
| Prudent tone | general impression from 1 (“not at all displayed”) to 10 (“very much displayed”) | | x |
| Nonverbal stress (reversed) | general impression from 1 (“not at all displayed”) to 10 (“very much displayed”) | | x |
| Careless tone (reversed) | general impression from 1 (“not at all displayed”) to 10 (“very much displayed”) | | x |

†Cluster of Ford et al. [30] for BBN setting in oncology; computed using coding of the Roter Interaction Analysis System (RIAS) [31].

‡Seven nonverbal behaviors defined as important in a BBN setting [32] aggregated into a single variable (Cronbach’s alpha = .67).

**Table 2**

*T-Tests between Pre- and Post-Training of Intervention Group Students (Paired-Sample) and between Intervention and Comparison Group at Post-Training (Independent Sample)*

| | Intervention Group | | | | | Comparison group | | Intervention vs Comparison |
|---|---|---|---|---|---|---|---|---|
| | Pre-training | | Post-training | | T-test Pre- vs Post- | Post-training | | T-test Post- vs Post- |
| | *M* | *SD* | *M* | *SD* | *t* (*df* = 59) | *M* | *SD* | *t* (*df* = 118) |
| AP evaluation | | | | | | | | |
| Overall impression | 3.28 | 0.74 | 3.60 | 0.77 | 2.76** | 3.50 | 0.74 | 0.71 |
| General satisfaction | 3.08 | 0.79 | 3.40 | 0.77 | 2.75** | 3.27 | 0.75 | 1.01 |
| PSQ | 2.81 | 0.36 | 2.98 | 0.37 | 3.14** | 2.95 | 0.36 | 0.44 |
| PSQ information exchange | 2.81 | 0.37 | 2.93 | 0.40 | 2.19* | 2.91 | 0.36 | 0.31 |
| PSQ quality of time | 2.96 | 0.34 | 3.15 | 0.34 | 3.66** | 3.09 | 0.38 | 0.97 |
| PSQ interpersonal skills | 2.89 | 0.36 | 3.04 | 0.34 | 3.17** | 3.05 | 0.35 | 0.03 |
| PSQ empathy | 2.61 | 0.44 | 2.82 | 0.46 | 3.16** | 2.77 | 0.45 | 0.64 |
| Trust | 3.43 | 0.65 | 3.79 | 0.60 | 4.00*** | 3.67 | 0.64 | 1.11 |
| Liking | 3.28 | 0.76 | 3.53 | 0.73 | 2.22* | 3.43 | 0.74 | 0.71 |
| Competence | 3.36 | 0.70 | 3.62 | 0.65 | 2.76** | 3.59 | 0.59 | 0.20 |
| Medical competence | 3.30 | 0.77 | 3.62 | 0.68 | 3.19** | 3.61 | 0.63 | 0.12 |
| Interpersonal competence | 3.44 | 0.69 | 3.61 | 0.69 | 1.71 | 3.57 | 0.66 | 0.27 |
| Experts evaluation | | | | | | | | |
| Overall impression | 3.08 | 0.96 | 3.63 | 0.96 | 3.83*** | 3.08 | 0.81 | 3.40** |

*Note*. *N* = 120: 60 intervention group students and 60 comparison group students.

*p < .05, **p < .01, ***p < .001

**Table 3**

*Intervention Group Students' Behavioral Changes from Pre- to Post-Training Regressed on AP Evaluation*

| | Overall impression | General Satisfaction | PSQ-MD | PSQ-MD IE | PSQ-MD IS | PSQ-MD E | PSQ-MD QT | Trust | Liking | Competence | Medical Competence | Interpersonal Competence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *B* | *B* | *B* | *B* | *B* | *B* | *B* | *B* | *B* | *B* | *B* | *B* |
| verbal behaviors changes | | | | | | | | | | | | |
| Social Talk | -0.14 | -0.16 | -0.04 | -0.05 | -0.07 | -0.02 | -0.01 | -0.10 | -0.12 | -0.13 | -0.19 | -0.04 |
| Positive talk | 0.05* | 0.05* | 0.03** | 0.03* | 0.02** | 0.03* | 0.02* | 0.04** | 0.04* | 0.04* | 0.04* | 0.04* |
| Negative talk | -0.04 | 0.00 | -0.04 | -0.05 | -0.04 | -0.04 | -0.04 | -0.02 | -0.08 | -0.05 | -0.05 | -0.05 |
| Emotional responsiveness | 0.06** | 0.06** | 0.03** | 0.03** | 0.03*** | 0.03** | 0.02* | 0.05*** | 0.06** | 0.05** | 0.05** | 0.05** |
| Partnership building | 0.03 | 0.03 | 0.02 | 0.02 | 0.02 | 0.01 | 0.02 | 0.04 | 0.02 | 0.03 | 0.03 | 0.02 |
| Orientation | 0.08 | 0.09 | 0.04 | 0.03 | 0.03 | 0.06 | 0.05 | 0.03 | 0.08 | 0.06 | 0.09 | 0.03 |
| Open questions | -0.04 | -0.05 | -0.03* | -0.04* | -0.02 | -0.04 | -0.02 | -0.04 | -0.06 | -0.05 | -0.05 | -0.05 |
| Closed question | 0.10 | 0.11 | 0.07* | 0.07* | 0.06* | 0.07 | 0.06* | 0.10* | 0.10 | 0.11* | 0.12* | 0.11 |
| Biomedical info | 0.10** | 0.11*** | 0.05*** | 0.05** | 0.05*** | 0.07** | 0.05*** | 0.08*** | 0.10** | 0.09*** | 0.09*** | 0.08** |
| Psychosocial info | 0.06* | 0.06* | 0.04** | 0.03* | 0.03** | 0.04** | 0.04** | 0.04* | 0.05* | 0.05* | 0.06* | 0.05* |
| Biomedical counseling | 0.17* | 0.15* | 0.08** | 0.07* | 0.07** | 0.11** | 0.09** | 0.11* | 0.14* | 0.13* | 0.11* | 0.16* |
| Psychosocial counseling | -0.03 | -0.03 | -0.02 | -0.02 | -0.01 | -0.02 | 0.00 | -0.03 | -0.04 | -0.03 | -0.02 | -0.04 |
| *F* | 1.81* | 1.89* | 2.53** | 2.68** | 2.66** | 1.94* | 1.93* | 2.52** | 2.15* | 2.30* | 2.67** | 1.64 |
| $R^2$ | 0.44 | 0.45 | 0.53 | 0.54 | 0.54 | 0.46 | 0.46 | 0.52 | 0.49 | 0.50 | 0.54 | 0.42 |
| nonverbal behaviors changes | 0.23 | 0.30 | 0.16* | 0.20* | 0.11 | 0.22* | 0.09 | 0.23 | 0.26 | 0.24 | 0.24 | 0.24 |
| *F* | 1.32 | 1.33 | 1.81 | 2.61* | 1.46 | 1.56 | 0.81 | 1.85 | 1.55 | 1.75 | 2.22* | 1.17 |
| $R^2$ | 0.15 | 0.15 | 0.20 | 0.26 | 0.16 | 0.17 | 0.10 | 0.20 | 0.17 | 0.19 | 0.23 | 0.14 |

*Note.* $N = 60$ intervention group students. Control variables = gender and cohort of medical students, gender, education, age, and number of days between sessions of APs (averaged for each interview). PSQMD = Princess Margaret Hospital Satisfaction with Doctor Questionnaire, IE = Information Exchange, IS = Interpersonal Skills, E = Empathy, QT = Quality of Time.

*$p < .05$, **$p < .01$, ***$p < .001$

## Figures

**Figure 1**

*Existing data and subsample randomly selected for the present study*