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Original Article

Communication of bad news in relation with surgery or anesthesia: An interdisciplinary simulation training program

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ABSTRACT

Introduction: Disclosure of damage related to care is a difficult area of communication due to the physician's feeling of guilt or the fear of liability. The aim of this study was to develop, and to evaluate the impact of an inter-disciplinary simulation program on communication of damage related to care.
Methods: Residents in gynecology/obstetrics and anesthesiology participated in role-playing scenarios of communication of damage related to care. We assessed verbal, non-verbal communication skills and inter-disciplinary relations with a modified SPIKES protocol and with a video analysis with predefined indicators. We evaluated long-term impact of the training at 3–6 months with combining self-assessment and a video analysis on retained knowledge.
Results: We included 80 residents in 15 sessions of simulation. Satisfaction regarding the simulation training was high (9.1/10 [8.9–9.3]). The part of the SPIKES protocol "setting up the interview" was the more difficult to apply. Empathic attitude was adopted 80 % of the time in the two scenarios with a life-threatening complication but was less common in the anesthetic one (broken tooth). The residents found interdisciplinary disclosure helpful due to support from the other resident. Immediately after the session, residents reported an important improvement in communication skills and that the session would significantly change their practice. At 3–6 months, reports were still largely positive but less than on immediate evaluation.
Conclusion: Residents did not master the most important communication skills. The interdisciplinary method to breaking bad news was felt useful.

Introduction

Simulation is a pedagogical method, which use is growing in medical and surgical specialties. It was initially developed to improve technical skills, but many studies have now demonstrated that simulation can also improve communication and more generally non-technical skills. Physicians frequently break bad news. Buckman defined bad news as any news that drastically and negatively alter the patient's view of his (her) future [1]. The way that bad news are delivered can affect the doctor-patient relationship and the patient's adjustment to illness [2]. However, breaking bad news teaching is limited (if not taught at all) in the medical school. Physicians mainly learn through practice and errors or by observing their peers or their trainers. In this context, simulation was first developed in oncology to improve physician's communication methods to deliver a diagnosis of cancer [3]. Studies demonstrated that simulation significantly improves communications skills and that students feel more comfortable with breaking bad news [2]. A randomized study also concluded that simulation is more effective than lecture to improve self-evaluation [4].

To date however, few studies have evaluated the potential value of simulation to deliver information about damage related to care, especially in surgery. Announcing such bad news is difficult because of physician's emotion such as guilt or fear of liability.

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Residents rarely receive formal training whereas the quality of announcement significantly impacts patient's satisfaction and modifies the risk of complaint for misconduct [5].

In surgery, communication between surgeons and anesthesiologists is crucial and teamwork is needed in both planned and emergency situations. Interprofessional education is a way to enhance healthcare professional's skills like teamwork and leadership [6]. There is growing evidence that interprofessional education can have a positive impact on working collaboratively, thus improving patient care [6]. Applying interprofessional team-based learning has been shown to be a promising method to learn about patient safety [6]. However, in the literature, only 22 % of the simulation programs are interdisciplinary programs [7]. We hypothesized that disclosing a serious iatrogenic side effect using an interdisciplinary cooperation model would improve the quality of announcement and patient's understanding of the mechanism of injury and its treatment. It could also be helpful for physicians themselves as they can interact during the disclosure encounter with the medical speech becoming more consistent and potentially reassuring the patient. The aim of this study was to develop, implement, and evaluate the impact of an interdisciplinary simulation program to train residents in surgery and anesthesiology to disclose damage related to care.

Methods

We conducted a prospective, single center study between October 2018 and July 2019 in a simulation center. This study was approved by the institutional review board of the French college of obstetricians and gynecologists (CEROG).

Description of sessions' course

Residents in obstetrics and gynecology (OG-Resident) and anesthesiology (A-Resident) were invited to attend a half-day training session. Three OG-Residents and three A-Residents attended each session and were involved by dyads in each scenario. When not playing in the scenario, residents observed their colleagues. Residents had to break an intraoperative complication, which had occurred during functional surgery. Three role-playing scenarios of damage related to care were presented. The first scenario consisted to disclose injury to the external iliac artery during laparoscopic sacropexy. In the second scenario, cardiac arrest, which had occurred during hysteroscopic myomectomy has to be disclosed. In the third one, anesthetic dental injury had occurred during airway management by the anesthesiologists during trans-obturator vaginal tape surgery. An experienced member of the simulation center trained in role-playing simulated the patient or the family member. At least three instructors, who were trained to manage simulation sessions, conducted the whole session, including the debriefing. One was psychologist and the others were senior specialists in Obstetrics and Gynecology, Anesthesiology or Psychiatry.

At the beginning of the session, participants were asked to sign a release waiver (for research purposes) and the principles of simulation training were presented to the residents during a standardized briefing. Then, a video demonstrating poor patient-physician relation damage available was presented. The video had been downloaded from the website of The Haute Autorité de Santé (i.e. the French Agency dedicated to quality and safety in Health Care). Residents were asked to spontaneously identify positive and negative attitudes and described them on a pre-filled form, which was collected and subsequently analyzed. This questionnaire was used to determine their pre-test knowledge about disclosure of bad news. Roles were then distributed, and scenarios began.

The three scenarios were video recorded. A debriefing was associated with each scenario and a final debriefing was performed at the end of the three scenarios.

Self-evaluation by participants

Demographic data and data concerning experience of the student in simulation and in breaking bad news were collected.

At the end of the session, participants filled in a questionnaire to evaluate their reaction (i.e. Kirkpatrick level 1) (global satisfaction, scenario realism, stress management), the value of the session regarding their self-assessed improvement of their communication skills (i.e. Kirkpatrick level 2), and the expected change of their medical practice (i.e. Kirkpatrick level 3) which was used as the main outcome measure [8]. A 1-10 Likert scale was used for each of the 10 criteria assessed in the questionnaire.

External evaluation by trainers

During the scenario, trainers evaluated participants' communication skills using the six-step protocol for delivering bad news described by Baile et al. [9]. This protocol consisted of six steps (Setting, Patient's Perception, Invitation, Knowledge, Empathy, Strategy) (SPIKES) to enable the physician to fulfill the four most important objectives of disclosing bad news: gathering information, transmitting the medical information, providing support to the patient, developing a strategy with the patient for the future. each item of the SPIKES protocol was evaluated using a 1-5 Likert scale.

Videos of the scenarios were analyzed a posteriori with Observer® program (Noldus Information Technology B.V.) to assess more precisely different items of verbal and non-verbal communication. This program is used to code and to quantify human behavior [10]. The coded behaviors were defined at the beginning of the study, including eye contact, body position and hand gesture as surrogates of empathic attitude [11]. A single observer (CS) performed the whole analysis. Quantifying each physician's and patient's speaking time and counting eye contacts between the two residents analyzed interdisciplinary communication. Finally, the use of technical words was evaluated using a 1-5 Likert scale.

Long-term assessment

A self-assessment questionnaire similar to that used on the simulation day was sent via email to the participants 3–6 months after the session. The objective was to assess the impact of the course on their professional practice.

The study participants were also asked to view the same video (i.e. in which the physician behavior was poor during a medical encounter) that they had seen immediately before the simulation session. They were asked to fill the same questionnaire aimed at describing the pros and cons of the physician's attitude in the video. Responses of participants were compared and evaluated with a predefined keyword list. Long-term results were compared in pairs with those obtained before simulation session.

Statistical analysis

Descriptive analysis was first performed. Results are expressed as mean (95 % confidence interval) or median (interquartile range) for continuous variables and as numbers, percentage (n, %) for qualitative variables. Means were compared using Student's *t*-test and Wilcoxon test in paired series was used for medians. The Chi square test was used for qualitative variables. The data were analyzed using STATA/SE (version 14/Stata Press, 204 Zachry

Engineering center College Station, TX, 77843, USA). A p value of < 0.05 was considered statistically significant.

Results

The characteristics of the 15 simulation sessions performed and the 80 residents who participated are described in Table 1. Data describing self-assessment of learning are reported in Fig. 1. Overall satisfaction, perception that the simulation session was useful and that it will help them change their practice were highly scored (respectively 9.1/10 [8.9–9.3], 9.3/10 [9.1–9.5], and 8.5 [8.2–8.8]) (Fig. 1). Realism was also highly scored (8.8 [8.6–9.0]).

As shown in Table 2, most steps were poorly performed and scored. Among the parts, which were easiest to perform, describing the patient's condition and providing medical information were well done as well as providing this information with an empathic behavior. The fields "setting up the interview" and "closing the encounter" were the more difficult steps to apply and had the lowest scoring values. Residents had indeed difficulties to close the interview in 20 scenarios (45 %). Assessing patient's perception and getting patient's invitation were not spontaneously performed in most cases. Very often, the trained actor had to request to see the patient or the relative as a mean to close the scenario. Finally, psychosocial support was rarely offered. Residents indeed looked neither for family support nor for impact of the damage on personal life or on professional activity. Medical jargon was avoided in 27 scenarios (60 %).

The mean duration of scenario 1, 2 and 3 was 8.9 (CI95 % [5.9–11.7]), 7.5 (CI95 % [5.4–10.3]) and 7.5 (CI95 % [5.9–9.4]) minutes respectively. Speaking time was shared between the two residents in scenario 1 and 2 while in scenario 3, the A-Resident spoke significantly longer than the OG-Resident (Fig. 2). Silence represented 7% of the total duration in scenario 1 and 3 and 18 % in scenario 2 (Fig. 2) because the relative's script indicated that he (she) had to be mutic. Table 3 shows that the OG-Resident used significantly more medical terms than the A-Resident in scenario 1 (surgical complication). By contrast, in scenario 2 and 3, the A-Resident used more medical terms. All residents systematically acknowledged their responsibility when the actor (substitute of patient/relative) explicitly asked them but three residents (3.8 %) spontaneously apologized during scenarios 1 and 3.

Concerning non-verbal cues (Table 3), residents generally adopted an empathic attitude in scenarios 1 and 2 and gazed at the patient in more than 80 % of the time in the three scenarios. However, in the third scenario in which the complication was less severe, the empathic attitude was less common.

The OG-Resident gazed at his (her) colleague during 40 % of the time and the A-Resident during 50 % of the time in the first scenario. In the second scenario, the gaze of the OG-Resident and of the A-Resident was toward his (her) colleague during 50 % and 20 % of the time respectively. Finally, in the third scenario, the OG-resident and the A-Resident gazed at his (her) colleague during 80 % and 20 % of the time respectively.

All residents answered the questionnaire presented at the end of the simulation session (n = 80). Fig. 1 shows that residents believed that the session was useful to improve their skills and might have a beneficial effect on their future practice. Sixty-two residents (77.5 %) answered at the 3–6 month questionnaire. Among them, 27 residents (43.5 %) had to disclose a damage related to care after the simulation session. Scores at the 3–6 month questionnaire were significantly lower than those reported immediately after simulation, but some improvement in their communication skills (7.0/10 [6.6–7.4] at 3–6 months versus 8.6 [8.3–8.8] ($p < .01$) immediately after simulation) and some benefit regarding their future practice (8.6/10 [8.2–9.0] at 3–6 months versus 9.3 [9.1–9.5] $p < .01$) immediately after simulation) were still perceived.

Residents looked twice (immediately before the start of the simulation session and 3–6 months later) at a video describing a mock medical encounter in which a poor physician-patient relation was scripted. We observed a significant improvement between the test before the session compared to 3–6 months later in each resident with a mean score of 7.4 [6.7−8.0] to 11.0/15 [10.3−11.7] ($p < .05$) (Table 4). No significant difference was observed according to specialty, seniority or gender of the residents (Table 4).

Discussion

This study was performed to elaborate and evaluate an interdisciplinary damage-related to care-announcement simulation training program. This study showed that although most residents involved in the study had already participated in a simulation training session, less than half of them (40 %) had been trained to breaking bad news through simulation. Residents had overall limited clinical experience of announcement. Residents did not master the most important communication skills and this was not related to their seniority or specialty.

Residents in our study did not feel comfortable disclosing their errors. These results are in strong agreement with studies performed during the last twenty years in various specialties such as pediatrics, emergency care or surgery [12,13]. Barrios et al. reported residents' limitations to announce care-related injury or accidental findings when assessed using the SPIKES protocol [14]. They also found that announcement of a iatrogenic injury was more challenging compared to incidental findings. This is likely due to guilt or to the risk that it is felt as a disregard of the event. This leads to the fact that only a portion of residents are well disposed to disclose the error [15].

Improving students' and residents' ability to such disclosure has been the subject of many studies, many of them using simulation to construct and assess better attitudes toward patients and

Table 1
Characteristics of the eighty residents included between October 2018 and July 2019.

	Residents n = 80
Specialty n (%)	
Obstetrics-Gynecology / Anesthesiology	38 (48) / 42 (52)
Gender, n (%)	
Female / Male	51 (64) / 29 (36)
Age (mean [IC95 %])	27.6 [27.1−28.1]
Year of residency (median [min-max])	3 [1–5]
Previous experience in simulation, n (%)	71 (89)
Experience in simulation dedicated to breaking bad news, n (%)	23 (40)
Clinical experience in disclosure of damage related to care, n (%)	13 (23)

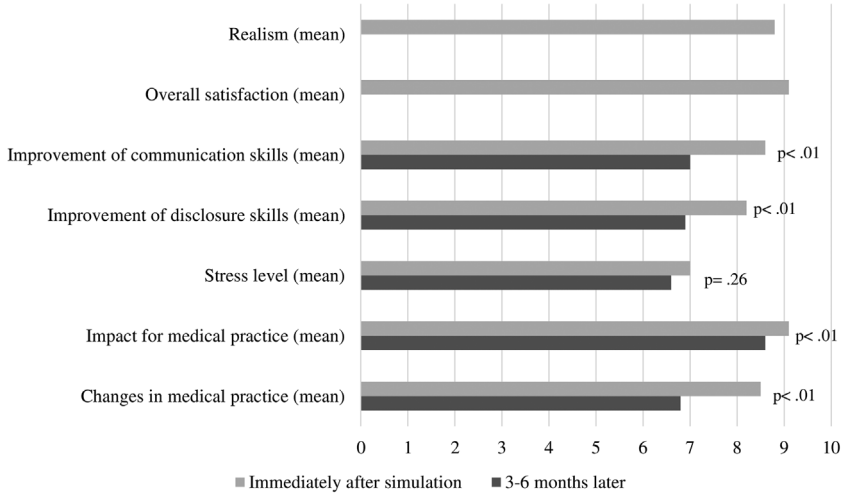

Fig. 1. Subjective assessment immediately and 3-6 months after the simulation session, using a 1-10 Likert scale for each of the 10 criteria (mean).

Table 2
Mean values obtained for each item of SPIKES protocol [12] for the whole group.

	Total (/4)
Setting up the interview	
To introduce themselves (mean (SD))	3.7 (0.1)
Create a comfortable setting (mean (SD))	2.1 (0.2)
Seek comfort of the patient (mean (SD))	2.4 (0.2)
Assessing the patient's perception (mean (SD))	2.7 (0.1)
Obtaining the patient's invitation (mean (SD))	2.8 (0.1)
Giving knowledge and information to the patient	
Avoid medical jargon (mean (SD))	3.0 (0.1)
Physical condition clearly described (mean (SD))	3.4 (0.1)
Reinforce and clarify information (mean (SD))	3.1 (0.1)
Check to see if information was correctly received by patient (mean (SD))	2.6 (0.1)
Time of silence (mean (SD))	2.6 (0.1)
Addressing the patient's emotions with empathic responses	
Respond empathetically (mean (SD))	3.2 (0.1)
Provide information in small increments (mean (SD))	3.3 (0.1)
Non-verbal communication (mean (SD))	2.9 (0.1)
Stress (mean (SD))	2.3 (0.1)
Strategy and summary	
Allow hope (mean (SD))	3.2 (0.1)
Offer psycho-social support (mean (SD))	2.1 (0.1)
Can close the interview (mean (SD))	2.7 (0.1)

SD: standard deviation.

families [16]. The use of simulation-based training in healthcare has been repeatedly shown to be associated with increased satisfaction, perception of better knowledge gain and usefulness for future practice [17]. This was also found in the present study. Satisfaction and the subjective feeling of improvement between the pre and the post-test were indeed associated with a perceived positive impact of the course on the residents' competence.

In our program, which was created to test the value of an interdisciplinary announcement, 66 % of residents concluded that the presence of a colleague was helpful. Performing the encounter with their colleague subjectively facilitated the relationship with the patient and most residents acknowledged that interdisciplinary announcement had several advantages. First, it allowed having a single and uniform speech, which was reassuring for the patient, eliminating the risks related to fault rejection on the other specialist and avoiding doctor's accusation by his (her) colleague and by the patient (or the relative). It also allowed finding some support from the other physician, and this was useful for both disclosing technical details or to manage highly emotional or stressful parts of the encounter. It was indeed often observed that when one resident was leading a given portion of the discussion mostly related to his (her) specialty but was encountering a difficult moment, spontaneous bridging by the other resident taking the lead was a salutary change and allowed to mitigate the relational and conflictual tension of the encounter. This was true even if the resident taking the lead was less competent on the specific topic discussed. Because one resident could feel guilty when the iatrogenic event was related to his (her) specialty or his (her) own practice, his (her) capacity to manage unemotionally the encounter was often reduced. By contrast, the other resident feeling uninvolved in the complication could maintain his (her) discussing capacity and maintain a more effective discussion. Although the present study did not compare the relative value of such interdisciplinary encounters to a more traditional, stand-alone announcement, instructors' observations and residents' comments highly valued this method. In addition, managing encounters using an interdisciplinary design is likely to strengthen team building and the idea that working as a team is useful [6]. Similar benefits have been observed in other areas of care with truly interprofessional team members sharing the encounter model [7]. It should however be mentioned that 30 % of our residents expressed some concern with this method because they

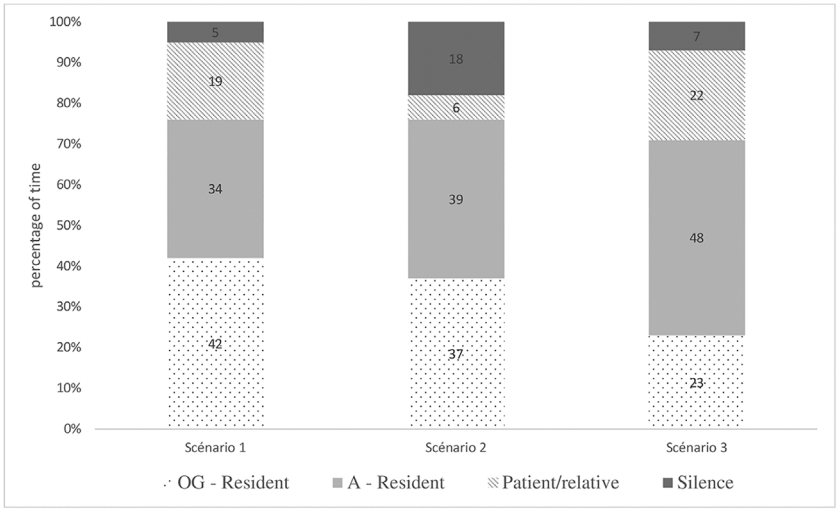

Fig. 2. Assessment of verbal and non verbal communication skills using the Observer XT program and proportion of speaking and silent time according to the resident's specialty in the three scenarios (%).

Table 3
Verbal and non-verbal cues during the three scenarios.

	Scenario 1	Scenario 2	Scenario 3
Use of jargon (technical words used) (mean (SD))			
OG-Resident	1.6 (0.6)	0.1 (0.4)	0.1 (0.3)
A-Resident	0.4 0.7)	0.9 (1.5)	0.9 (1.4)
Eye contact with the patient (% of time (SD))			
OG-Resident	84 (18)	85 (18)	80 (14)
A-Resident	86 (16)	92 (13)	82 (24)
Leaning forward posture (% of time (SD))			
OG-Resident	80 (33)	87 (32)	60 (42)
A-Resident	55 (47)	90 (33)	40 (46)
Hands on the table (% of time (SD))			
OG-Resident	81 (27)	82 (27)	31 (44)
A-Resident	84 (93)	79 (25)	27 (34)

SD: standard deviation.

Table 4
Scoring of the video scripting a poor physician-patient relation before and 3-6 months after the simulation session. No physician-related factor was found to modify the score. Mean [range].

	Pre-test (/15) n = 41	p	Post-test (/15) n = 41	p
Global	7.4 [6.7–8.0]		11.0 [10.3–11.7]	
Gender		.10		.11
Female	7.7 [7.0–8.5]		11.4 [10.6–12.1]	
Male	6.6 [5.4–7.8]		10.2 [8.7–11.6]	
Age		.98		.73
≤ 27 year-old	7.4 [6.2–8.5]		11.1 [10.0–12.3]	
> 27-year-old	7.4 [6.6–8.2]		10.9 [9.9–11.8]	
Year of residency		.87		.23
≤ 3rd year	7.3 [6.3–8.3]		10.6 [9.5–11.7]	
> 3rd year	7.4 [6.6–8.3]		11.4 [10.6–12.3]	
Specialty		.97		.43
OG-Resident	7.4 [6.6–8.2]		11.2 [10.3–12.1]	
A-Resident	7.4 [6.2–8.5]		10.6 [9.5–11.8]	

disagreed with the colleague or because of a non-equitable distribution of the speaking time.

The use of medical terms was important and particularly in the scenarios in which responsibility of one of physician was likely (scenario 1 and 3). Technical words increase the distance with the patient and are known to be a protection for the doctor [18]. For the patient, the use of these words increases distrust and decreases the perception of their ability to manage their health condition [19]. Time speaking analysis showed that doctors dominated the speech and limited the dialogue with the patient. In the literature, less than 50 % of the physicians provide all the details of the medical error, and discuss how to prevent a future error [20]. It has been suggested that the patient would be less upset with explicit apologies [20] and that this could reduce the risk of litigation. However, because of the fear of litigation, dishonor and financial settlements, doctors sometimes hesitate to deliver clear and truthful information. In addition, for some physicians, apologizing could be considered as an acknowledgment of a legal responsibility and could lead to a lawsuit. Explicit spontaneous apologies were less commonly expressed in our study (3.8 %) than in other studies. White et al. surveyed a large number of students and residents at two US academic medical centres and showed that 46 % were prone to making an explicit apology [21]. In the present study however, all residents admitted their responsibility in the different sessions when the simulated patient asked them. There may be also a difference in culture and tradition between the US and European physicians explaining these different behaviours. While it seems that expressing apologies is common and recommended in US and other English-speaking countries [22], it is much less so in European countries where physicians more commonly state that they are sorry, using protective or partial apologies, rather than admissions or full apologies [23].

The Observer XT program allowed a precise analysis of non-verbal behavior. Residents most often had an empathic attitude with a leaning forward posture and gazing toward the patient. However, we observed that this empathic attitude was significantly less frequent in the third scenario. In this scenario, residents recognized during debriefing that it was difficult for them to be empathic because the injury was not vital. They minimized the patient's distress, possibly because this case was the last one and was played after two cases of life-threatening injuries. Several studies documented that non-verbal communication has the most consistent effect on perception of encounter quality and on patient's satisfaction [11,24]. Hannawa et al. compared patient's reactions after announcement with and without non-verbal involvement. They found that well-performed non-verbal communication during damage related to care announcement facilitates patient's understanding whereas a lack of involvement compromises the effectiveness of disclosure [24].

In the systematic review by Stroud et al., the authors showed that one limitation of studies performed to improve damage related to care disclosure was that long-term retention of learning was not studied [25]. We observed that scores depicting residents' skills retention declined as early as three months after training [26]. This decay has been observed in multiple studies and occurs for both procedural and non-technical skills although it has been shown that cognitive-based tasks are more susceptible to loss than physical tasks [27]. In addition to memory loss of not well-anchored knowledge, poor insight and high bias in the recall of subjects can increase the decay. Various techniques have been used to maintain knowledge and skills in the long-term. One can mention refresher courses, use of virtual patient, early training in childhood, repetitive training, using the testing effect by repeated tests being performed following the initial training session and repeated sessions. Simulation-based training is also useful to maintain skills and interestingly, it seems that interprofessional simulation-based training has increased effects [28]. Collectively, these data suggest that the Kolb experiential theory used in innovative learning methods such as simulation can be effective to maintain proficiency. In the specific domain of breaking bad news, two additional factors may play a role. First, as shown in questionnaires, residents are rarely placed in this situation since only 23 % of them had already participated in an encounter in which such a disclosure was performed. Since it is well known that the longer the period of non-use the lower the skills and the greater the decay [27], our results could not be seen as surprising. Moreover, it has been demonstrated that empathy declines during the first year of clinical practice and even at the late stages of undergraduate medical education in some countries [29] suggesting that this can be a threat for the quality of difficult encounters and breaking bad news.

This study has several limitations. The main one is the trainers' subjectivity for SPIKES questionnaire, even if analysis of the questionnaire was very uniform between trainers. In addition, a single observer analyzed all videos. Another limitation is the generalizability of results about involvement in real medical practice, even if residents considered scenarios realistic. A simulation session combining technical skills and announcement might be more realistic and would allow residents to be more emotionally engaged [30]. This kind of simulation's session however requires more financial and human resources.

Finally, long-term assessment in announcement simulation is difficult. We chose to question residents with e-mailing. This approach led to a relatively low response rate (three reminders were necessary to reach the final response rate).

The absence of a control group including residents who did not follow the course is also a limitation and can limit the scope of the results.

Conclusion

This study describes and evaluates an interdisciplinary simulation program of communication of care-related damage. Residents do not feel comfortable disclosing their errors and do not master the most important verbal and non-verbal communication skills. Simulation appears to be an efficient method at short and long term to learn communication of damage related to surgical or anesthetic care.

The interdisciplinary method to breaking bad news was felt to be useful and has to be promoted to improve and facilitate the patient-physician relationship in the context of care related damage.

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