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Research Article

Comparison of Two Simulation Tools to Develop Empathic Communication Skills in Nursing Students Breaking Bad News: A Randomized Controlled Study

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breaking bad news;
empathy;
nursing;
student;
simulation-based learning

Abstract

Background: The announcement of a pathology that could have a negative impact on a patient's future (i.e., breaking bad news, BBN) is a common and difficult task that nurses feel unprepared for. This study compared the effectiveness of two online simulation-based training tools: a standardized patient, currently the most commonly used method, and 360° immersive videos, which could represent an alternative that demands fewer resources.

Method: Sixty-nine nursing students were involved in a randomized controlled noninferiority trial and allocated to one of three conditions: standardized patient (SP); 360° immersive videos (360IV); and control group (CG). In all three conditions, pre, post, and one-month follow-up measurements were based on recorded role-plays with patient-actors and questionnaires. Using recordings, external raters assessed students' communication skills along three dimensions related to BBN: empathic communication, building shared understanding, and shared decision-making. Right after the prepost role-plays, patient-actors assessed perceived empathy and confidence. Participants completed questionnaires assessing empathy, stress, and self-efficacy.

Results: Empathy perceived by the patient-actors increased in all conditions, but this increase was only maintained in the 360IV condition. In contrast, the SP condition produced the best communication results, as assessed by external raters.

Conclusions: The two training tools induced complementary changes in BBN skills among undergraduate nurses, opening up new possibilities for BBN training.

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Introduction

Bad news is an announcement that negatively impacts a person's vision of the future (Buckman, 1984). Examples in the field of healthcare include cancer, neurodegenerative diseases, and reduced autonomy. The impacts of empathic communication while breaking bad news (BBN) are wide-ranging. Empathic communication influences how patients follow treatment indications (e.g., taking medicine; Burgers, Beukeboom, & Sparks, 2012; Haskard Zolnierek & DiMatteo, 2009; Stavropoulou, 2011), and how satisfied they feel about their care (Boissy et al., 2016). In addition, two reviews indicate that empathic communication skills have been shown to reduce physical (Kelley, Kraft-Todd, Schapira, Kossowsky, & Riess, 2014) and mental symptoms (Lelorain, Brédart, Dolbeault, & Sultan, 2012). The first meta-analysis (N = 14) (Kelley et al., 2014) included different healthcare professionals and numerous indicators (e.g., pain, blood pressure), and revealed a small but statistically significant effect size of empathy on these indicators ($d' = 0.11$). The second systematic review (N = 39) (Lelorain et al., 2012) concluded that healthcare professionals' empathy is associated with reduced psychological distress in patients' response to illness. Therefore, it is important to address these skills during nursing studies because, on the one hand, they do not develop spontaneously with experience (Aspergren & Lonberg-Madsen, 2009) and, on the other, nursing students may face these kinds of difficult conversations during their placements. The importance of specific training for nurses is therefore increasingly emphasized (e.g., Banerjee et al., 2016), but their effectiveness still remains unexamined.

The SPIKES (Baile et al., 2000) is a well-known training guide in medicine, which is recommended for nurses (e.g., Mahendiran, Yeung, Rossi, Khosravani, & Perri, 2023; Rosenzweig, 2012). SPIKES is an acronym, each letter of which describes an element required to deliver bad news empathically. S stands for ***S****etting,* which involves creating a calm environment, and preparing for the encounter. P corresponds to ***P****erception,* a step that requires the nurse to address the patient's perspective and knowledge and to base new information on this initial knowledge. I stands for ***I****nvitation,* which aims to prepare the patient for the difficulty of the conversation by announcing it. K corresponds to ***K****nowledge,* the transmission of information with appropriate phrases and words. E refers to ***E****motion* and implies responding empathically to the patient's emotions. Finally, the second S stands for ***S****ummary*: it concerns the importance of summarizing the session and planning the next step.

These components are consistent with the person-centered approach required in nursing care (Park, Giap, Lee, Jeong, & Go, 2018). For example, with the Perception and Knowledge components, the clinician will develop an understanding of the patient's perspective in terms of emotions, preferences, and beliefs; and then help the patient achieve a clear understanding of their health condition (Pehrson et al., 2016; Street, Makoul, Arora, & Epstein, 2009). These elements therefore allow the construction of a shared understanding with the patient (Pehrson et al., 2016; Street et al., 2009). This kind of shared understanding is a prerequisite for shared decision-making (Griffith & Tengnah, 2013), which allows the patient to be involved in decisions based on their preferences and potential (Clavel et al., 2021).

Simulation is a teaching delivery method that is used commonly in a wide range of settings to develop communication skills (Faulkner, 1994; Tobler, Grant, & Marczinski, 2014). Simulation-based training usually involves three steps: the briefing, which aims to foster the development of a safe learning environment; the simulation, which mimics the clinical situation; and the debriefing, which consists of direct feedback on the experience facilitated by the trainer (Smith et al., 2007). This last step is recognized as playing a predominant role in learning via discussions and reflections on the experience (Mayville, 2011). Overall, this method allows trainers to provide a safe, controllable, and repeatable learning environment (Maclaine, Lowe, & Dale, 2021). In contrast, the simulation step is very varied in terms of delivery options. One widely used method to develop communication skills is role-playing with standardized patients (SP) (MacLean, Kelly, Geddes, & Della, 2017; Rønning & Bjørkly, 2019), namely people trained to play a specific patient (with varying clinical signs or emotional reactions; Demaurex & Vu, 2013). This method has been successfully used to train nurses in communication skills in different situations (e.g., Bloomfield, O'Neill, & Gillett, 2013; Hsu, Chang, & Hsieh, 2015; MacLean et al., 2017). It has also been used to train physicians to break bad news (Maclaine et al., 2021). In fact, SPs are particularly valuable in the area of BBN skills development, as they allow students to practice in a safe but realistic setting, giving them the opportunity to rehearse their skills without the risk of causing distress to real patients (Maclaine et al., 2021). In contrast, this method is less ap-

propriate in other areas of training such as basic technical skills (Boet, Savoldelli, & Granry, 2013).

However, an important disadvantage of SPs is the logistical resources involved (Lane & Rollnick, 2007). Several authors have suggested that the advent of new technologies opens up new and less costly possibilities for simulation (Hauze, Hoyt, Frazee, Greiner, & Marshall, 2019). One of these is 360° video, which allows for the creation of scenarios (Sultan et al., 2019) in which participants can be immersed by using special headsets. One advantage is the reduction in the resources required, both financial and human. This method also allows standardization of the student experience, which can be provided in different contexts as it does not require a specific environment. In contrast, 360° video does not allow the same degree of realism as SPs nor any interaction: the video is preset and does not allow interactions between the student and the "patient." The student passively observes the filmed scene. Some promising data exist. For example, several studies using this technology to immerse individuals in the perspective of stigmatized populations have shown a positive impact on self-reported empathy (e.g., Della Libera, Goosse, Larøi, & Willems, 2023; Schutte & Stilinović, 2017; Sundar, Kang, & Oprean, 2017). Thus this method allows participants to adopt other people's perspective in diverse situations. In addition, stepping into the patient's shoes (e.g., during a role-play with peers) increases their capacity for perspective taking (Della Libera et al., 2023; Lane & Rollnick, 2007). Finally, like current simulation tools, immersion in the patient's perspective can present an opportunity to show the nurse good or bad communication and offers material for debriefing, which is one of the active ingredients of simulation-based training. Indeed, some authors argue that debriefing includes the most active components of learning and simulation is *just an excuse to debrief* (Sawyer, Fleegler, & Eppich, 2016). In addition to the reasons described above, the comparison of these two types of simulation is based on this assumption.

This Study

In this context, this study aimed to assess the noninferiority of the 360° immersive video as compared to the more traditional method of using standardized patients in simulation-based learning. In the first condition (360° immersive videos, 360IV), the students were immersed, with immersive headsets, in the role of a patient facing a nurse whose communication either did or did not respect the SPIKES recommendations. The students had to passively observe the prerecorded video; they were instructed to try to put themselves in the patient's shoes during the BBN. In another condition (standardized patient, SP), the student actively played the role of the nurse, who had to discuss difficult information with an SP. In both situations, the exercise was followed by a debriefing session in which the SPIKES ingredients were discussed with a trainer. So the SPIKES elements were taught in both types of trainings through the debriefing; however, in the 360IV condition the learning was consolidated by the experience of taking the patient's perspective, while in the SP condition, it was consolidated through practice during role-play. A waiting-list design was used to compare the two groups of students' outcomes to a control group (CG); this group was called the waiting-list group because they received the training after the completion of the study to respect ethical considerations (see Figure 1 for more details).

The primary outcomes are the communicative skills (i.e., empathic communication, construction of shared understanding, and shared decision-making). These communicative behaviors were assessed through pre- (T0), post- (T1) and one-month (T2) recorded role-plays and analyzed by a blind rater. We postulated that communication skills would increase in both experimental groups, given the similar debriefing phase in both conditions.

Several secondary measures were collected: empathy and confidence perceived by actors playing the patients during these role-plays and students' self-reports of empathy, stress, and self-efficacy during the role-plays.

Finally, the two proposed training methods have been designed to be provided online via videoconference (using Teams). The required materials were sent by email or mail before the training. This aspect gives some initial indications of the methods' effectiveness at developing communication skills at a distance.

Method

Study Design

The study design was a randomized trial of the noninferiority type (see Figure 2). Participants were randomly assigned to two experimental conditions (SP and 360IV); and two CG, also called the waiting list, as participants in these groups received either the SP or 360IV training after the completion of the study; however, they were included in a single control group for the analyses.

The students in the experimental groups received the training immediately after a preassessment (T0) and completed both an immediate postassessment (T1) and a one-month follow-up assessment (T2) (see Figure 2).

The study was approved by the ethics committee in the Faculty of Psychology, Speech Therapy and Educational Sciences of the University of (removed for anonymization) (reference 1920-56). The writing of this paper was guided by the CONSORT statement (Moher et al., 2010).

Sample Size Calculation

An *a priori* power analysis performed with G*Power 3.1 (Faul, Erdfelder, Buchner, & Lang, 2009) defined the sam-

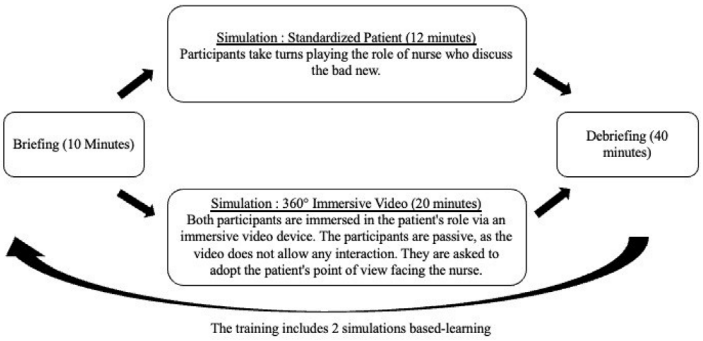

Figure 1 Description of the trainings.

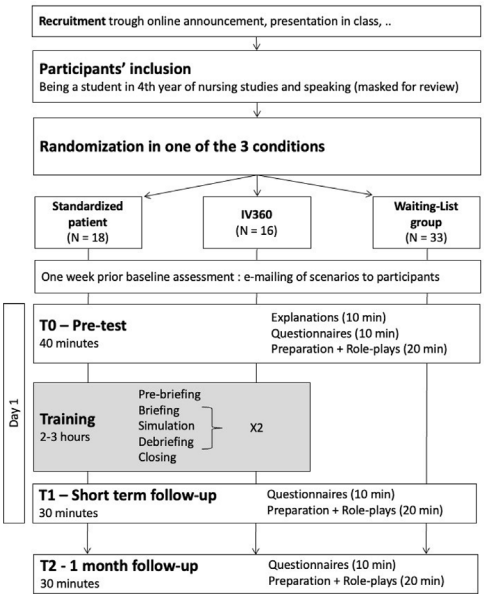

Figure 2 Study design.

ple size. A theoretical medium effect size ($f = 0.15$) (with power of 0.80, α-error of 0.05, and nonsphericity correction = 1) was defined, leading to a minimum sample size of 62 participants.

Eligibility Criteria and Recruitment

Participants had to speak (removed for anonymization) fluently and be registered in their fourth year of nursing studies, corresponding to the final year of the nursing program in (removed for anonymization). Recruitment was organized from October 2020 to November 2021.

Assignment to Groups

When four groups of two students were registered, they were randomly assigned by MG to one of the following groups: SP trained immediately; 360IV trained immediately; SP on waiting list; and 360IV on waiting list (1:1:1:1 allocation). The randomization used the RAND function provided by Excel.

The Two Conditions

Training in both conditions was organized similarly to a classical simulation session (Savoldelli & Boet, 2013): (a) briefing (10-15 minutes); (b) simulation (12 minutes for SP; 20 for 360IV); and (c) debriefing (40 minutes). These steps and the learning objectives were constructed based on the INACSL standards for Healthcare Simulation (INACSL Standards Committe, 2021). These same steps were repeated twice for two scenarios that were identical in both conditions. The first scenario concerns a patient who just received a diagnosis of multiple sclerosis from a doctor and who is angry about the time taken to make the diagnosis. In the second, the participant has to have a discussion following the drowning of a child with a parent who is worried and feels guilty about the child's death. Training sessions were organized in groups of two students in both conditions. The difference between the two conditions concerned the type of simulation (SP vs. 360IV; see Figure 1). In the SP condition, the simulation was organized with a standardized patient, and students had to play the role of the nurse breaking bad news in one scenario, and the role of an observer in the second. In the 360IV condition, both students played a patient facing a nurse who is announcing bad news (e.g., (Link to a video, anonymized)). They experienced the same scenario twice, once where the nurse was empathic and respected the SPIKES guidelines and once where the nurse did not. Therefore, the participants adopted different perspectives: in the 360IV condition, they adopted the patient's perspective and were mainly passive, while in the SP condition, they actively assumed the role of the nurse (see Appendix A.2 for more details). Finally, the debriefing step had the same structure and learning objectives in both conditions. It was constructed to promote partnership by favoring the building of a shared understanding and shared decision-making, with the SPIKES model as a basis (see Appendix A.2 for more details).

Table 1 – Description of the Measurements.

	Coder	Measurement Target	Measurement Tool
Primary measures			
Communications skills	External, based on recordings of the prepost roleplays	Empathic communication Building of a shared understanding Shared decision making	Interprofessional empathic communication scale (See appendix A.1.)
Secondary Outcomes			
Relational empathy	Patient actor	Empathy perceived by the patient actor during the role play	CARE (Mercer, Maxwell, Heaney, & Watt, 2004)
Trust towards clinician	Patient actor	To what extent the patient actor would follow clinical advice from the nurse	Visual analogous scale
Jefferson scale of empathy	Participants	To what extent the participant gives importance to empathy in the relationship	Jefferson scale of empathy (Fields et al., 2011)
Self-efficacy	Participants	The feeling of effectiveness regarding BBN	Visual analogous scale
Stress	Participants	The feeling of stress regarding BBN	Visual analogous scale
Anxiety	Participants	State anxiety	STAI (Bruchon-Schweitzer & Paulhan, 1990)
Baseline measure			
Dispositional empathy	Participants	To ensure equivalence between groups regarding dispositional empathy	IRI (Gilet et al., 2013)

Outcome Measures (Table 1)

A 30-minute videoconference was organized at each measurement time (T0, T1, T2). Four scenarios were developed in collaboration with an experienced teaching nurse (Erasmus+, 2015). Two pre and posttest scenarios involved an irritated adult (i.e., Hodgkin's lymphoma and stoma positioning); the two others involved a worried and guilty parent (i.e., acute lymphoblastic leukemia and Duchenne disease). Pre/post role-playing was done with blind trained actors playing the role of patient, to allow for standardized assessments. After the role-playing, the patient-actor and participants completed digitized questionnaires on a secure platform at (anonymized) university. To sum up, the training sessions were assessed at three levels: measures of empathic communication while discussing difficult news, assessed by an external rater; the empathy and confidence perceived by the patient-actor; and participants' self-reported measures of empathy, stress, and self-efficacy.

Primary Outcomes

Communication Skills. Two specially trained third-year psychology students rated the role-play recordings. The training consisted in coding one video with the experimenter, and then five videos alone, followed by a debriefing with the experimenter. Both raters were blinded to the participants' condition. They used an interprofessional empathic communication grid (IEC-BBN) that was constructed based on a Delphi procedure (for more details, see Appendix A.1). It consists of 40 items that assess three dimensions related to BBN: the first dimension assesses *empathic communication* (12 items); the second assesses the building of a *shared understanding* (16 items); and the third assesses *shared decision-making* (12 items).

Secondary Outcomes

Empathy and Confidence Perceived by Patient-Actor. The Consultation and Relational Empathy scale (CARE; Mercer et al., 2004) was used to measure relational empathy perceived by the patient-actor (for more information, see Appendix A.3). This scale has excellent reliability (Cronbach's alpha 0.93). Using a visual analog scale (VAS) ranging from 0 to 10, the patient-actor was also asked how much they trusted the nurse to follow a proposed treatment, as it was hypothesized that better communication skills would cause patients to feel more trust in the clinician.

Self-Reporting of Empathy. The Jefferson Scale of Empathy (JSE; Fields et al., 2011), which had satisfactory reliability ($\alpha = 0.78$), assessed the student's representation of the importance of empathy in healthcare (for informa-

Table 2 – Sociodemographic Data.

	360IV (N = 16)		SP (N = 18)		CG (N = 35)			
	Mean	*sd*	*Mean*	*sd*	*Mean*	*sd*	*Kruskall Wallis*	*p*
Age	25.38	5.29	24.06	3.15	24.43	4.63	0.54	.764
	%	*n*	*%*	*n*	*%*	*n*	*chi²*	*p*
Gender								
Women	93.75	15	88.89	16	94.29	33	0.54	.761
Men	6.25	1	11.11	2	5.71	2		
Other	0	0	0	0	0	0		
Experience with BBN								
Yes	37.5	6	50	9	42.86	15	0.55	.76
No	62.5	10	50	9	57.14	20		

tion, see Appendix A.3). The hypothesis was that dealing with both empathic and unempathic nurses during the immersion in the 360IV condition could affect this variable. In the SP condition, being in the observer's position could also have impacted this measure.

BBN-Related Stress and Self-Efficacy. Two visual analog scales (from 0 – low self-efficacy or low stress, to 10 – high self-efficacy or high stress) were used to rate participants' self-perception of their stress and self-efficacy related to BBN. The self-efficacy measure was designed to assess how effective participants felt at delivering bad news. In addition, the state subscale of the State-Trait Anxiety Inventory, which had excellent internal reliability ($\alpha = 0.95$) (STAI; Bruchon-Schweitzer & Paulhan, 1990; Spielberger, Gorsuch, & Lushene, 1983) was used to assess general anxiety (for more information, see Appendix A.3).

Controlled Measure of Empathy. The Interpersonal Reactivity Index (IRI; Gilet, Mella, Studer, Griihn, & Labouvie-Vief, 2013) was used to assess dispositional empathy to evaluate the equivalence of the groups (for information, see Appendix A.3). This scale had satisfactory to good internal reliability ($\alpha = 0.70$-0.80).

Statistical Analyses

Analyses were done with JASP 0.14.1. For analyses of the results, the two groups on the waiting list were amalgamated into one group (CG); thus, three groups were compared. Preliminary analyses explored group differences in demographic data (i.e., age, gender, experience with BBN; see Table 2), using the Kruskall-Wallis method or the Chi² test. Baseline level equivalence (IRI, IEC-BBN, CARE, JSE) was tested using one-way ANOVAs and Chi² tests (Table 3).

Mixed ANOVAs were performed to test the hypothesis that condition would interact with exposure to empathic communication skills (IEC-BBN), perceived empathy (CARE), perceived trust (VAS), self-reported measures of empathy (JSE) and stress (STAI, VAS), and the VAS assessing self-confidence and stress regarding BBN. When a significant difference was observed on the first ANOVAs, mixed ANOVAs were performed to test the maintenance of these differences between T2 and T3.

Exploratory Pearson correlations were done for the difference scores between T0 and T1 (delta) for communication skills and empathy perceived by patient-actors.

A correction for multiple testing was then applied with the Benjamini–Hochberg procedure (Benjamini & Hochberg, 1995).

Results

Participants

Overall, 69 students were recruited. Sixteen participants were randomly assigned to the 360IV, 18 to the SP, and 35 to the CG condition. Participants were not blinded regarding the different conditions at the time of their inclusion in the study. Four participants (360IV: 1; CG: 3) did not complete the follow-up (1 withdrew, 3 had logistical issues).

Groups were equivalent for each demographic (Table 2) and baseline variables (see Table 3).

Primary Outcomes

Communication Skills

No effect of time was observed regarding the empathic communication subscale (Table 4). As for building of a shared understanding, the mixed ANOVA revealed significant effects ($p < .05$) of both time and condition. Contrast analyses show a significant increase in the SP condition only. A repeated-measures ANOVA regarding the change in the results one month later did not show any significant effect ($t = –0.63$; $p = .531$), indicating that the increase in the SP condition was maintained. Regarding

Table 3 – Descriptive Results and Baseline Comparisons.

	360IV (N = 16)			SP (N = 18)			CG (N = 33)			Equivalence at T1	
	T0 (N = 16)	*T1 (N = 17)*	*T2 (N = 16)*	*T0 (N = 18)*	*T1 (N = 18)*	*T2 (N = 18)*	*T0 (N = 33)*	*T1 (N = 32)*	*T2 (N = 30)*	*KW*	*p*
Primary Outcomes											
Communicative skills											
EC	2.73 (0.85)	2.51 (0.42)	2.54 (0.45)	2.69 (1.00)	2.69 (0.59)	2.73 (0.47)	2.54 (0.77)	2.31 (0.58)	2.29 (0.51)	0.55	.759
BSU	1.19 (0.42)	1.4 (0.40)	1.34 (0.52)	1.16 (0.48)	1.57 (0.61)	1.5 (0.62)	1.24 (0.53)	1.21 (0.42)	1.07 (0.44)	0.58	.748
SDM	0.94 (0.41)	1.25 (0.38)	1.08 (0.41)	0.99 (0.48)	1.28 (0.5)	1.24 (0.4)	0.93 (0.49)	0.90 (0.45)	0.93 (0.44)	0.08[F]	.921
Perceived empathy	29 (8.64)	35.5 (8.41)	29.87 (9.67)	31.33 (11.54)	35.72 (11.13)	28.56 (8.23)	27.77 (10.01)	31.23 (10.44)	26.41 (10.79)	0.73	.484
Confidence	6.38 (1.58)	7.78 (1.18)	5.97 (2.18)	6.64 (1.98)	7.44 (1.69)	6.19 (1.96)	5.76 (2.13)	6.36 (2.4)	5.37 (2.31)	1.43[F]	.27
Secondary Outcomes											
Self-reported empathy (JSE)	61 (3.45)	57 (3.48)	57.78 (4.08)	60.89 (3.76)	59.94 (4.07)	56.17 (14.46)	60.85 (3.09)	58.79 (3.14)	59.12 (5.50)	0.01[F]	.989
Anxiety (STAI)	45.25 (7.84)	35.88 (10.54)	40 (11.50)	41.72 (11.9)	38.22 (10.84)	41.18 (11.43)	45.4 (11.57)	45.23 (13.71)	43.21 (12.26)	0.74[F]	.483
Self-efficacy	30.69 (19.07)	58.81 (16.67)	56.27 (11.7)	36.28 (20.8)	64.44 (21.34)	59.06 (23.31)	31.06 (21.88)	39.8 (23.18)	42.03 (23.93)	0.997	.607
Stress	70.25 (24.63)	53.81 (22.41)	59.93 (17.64)	80.17 (14.69)	62.67 (26.00)	63.13 (23.78)	71.82 (21.55)	71.03 (24.44)	69.58 (22.29)	1.46	.483

Note. BSU = building a shared understanding; EC = empathic communication; [F] = F ANOVA when normality was respected; KW = Kruskall Wallis; JSE: Jefferson scale of empathy; SDM = shared decision making.

Table 4 – Results of Repeated Measures ANOVA and Contrasts for Experimental Groups.

				Contrasts Analyses Effect of Time by Condition								
	T1-T2			360IV			SP			CG		
	F	*p*	n^2	t	*p*	*d*	t	*p*	*d*	t	*p*	*d*
Primary outcomes												
IPC-BBN												
EC												
Time	1.783	.186	0.01	-0.991	.325	0.31	-0.037	.971	-0.01	-1.48	.143	-0.28
*Time*Condition*	0.398	.673	0.005									
BSU												
Time	5.624	**.021**	0.025	1.49	.142	0.21	3.22	**.002**	0.84	-1.25	.215	-0.23
*Time*Condition*	5.928	**.004**	0.053									
SDM												
Time	8.074	**.006**	0.035	2.398	**.019**	0.78	3.397	**.019**	0.9	-0.4	.69	-0.07
*Time*Condition*	3.554	**.034**	0.031									
CARE												
Time	23.6	**<.001**	0.047	3.37	**.001**	0.53	2.42	**.019**	0.49	2.652	**.01**	0.34
*Time**Condition	0.86	.43	0.003									
CONFIANCE PS												
Time	19.78	**<.001**	0.046	3.41	**.001**	0.73	2.07	**.042**	.49	2.15	**.035**	0.71
*Time*Condition*	1.31	.276	0.006									
Secondary outcomes - JSE												
Time	28.79	**<.001**	0.095	-4.708	**<.001**	-1.58	-1.179	.243	-0.22	-3.532	**<.001**	-0.56
Time*condition	3.5	**.036**	0.023									
STAI												
Time	11.65	**.001**	0.029	-3.76	**<.001**	0.73	-1.49	.142	-0.39	-0.102	.919	-0.01
Time*Condition	4.68	**.013**	0.023									
Exploratory Outcomes												
Self-Efficacy related to BBN												
Time	72.86	**<.001**	0.163	5.295	**<.001**	1.25	6.297	**<.001**	1.78	2.725	**.008**	0.39
Time*Condition	7.859	**<.001**	0.035									
Stress related to BBN												
Time	15.296	**<.001**	0.051	-3.001	**.004**	0.79	-3.388	**.001**	0.89	0.274	.785	0.04
Time* Condition	5.765	**.005**	0.038									

* All results remains significant after Benjamini Hochberg correction ($p<.05$)

shared decision-making, a significant effect of time and an interaction were observed. Contrast analyses revealed significant increases in both experimental conditions. A repeated-measures ANOVA on the status one month later did not reveal any significant effect (360IV: $t = –1.64$; $p = .106$; SP: $t = –0.29$; $p = .771$), indicating that the increase was maintained in both experimental conditions.

Secondary Outcomes

Empathy and Confidence Perceived by Patient-Actor

Regarding perceived empathy, the analysis revealed a significant effect of time ($p < .05$) (Table 4). Contrast analyses showed significant increases in all three conditions. A mixed ANOVA measuring results one month later showed a significant decrease in the SP and control conditions (SP: $t = –2.32$; $p = .02$, $d = 0.35$; CG: $t = –1.96$; $p = .055$; $d = –0.41$).

Significant positive correlations were found between the deltas for perceived empathy and communication skills in both experimental conditions (SP: $r = 0.49$; $p = .04$; 360IV: $r = 0.67$; $p = .004$), whereas no significant correlation was found for the CG ($r = 0.11$; $p = .52$).

Regarding perceived confidence, the results revealed a significant effect of time ($p < .05$). Contrast analyses revealed significant increases in all three conditions. A repeated-measures ANOVA on the difference in the three conditions between T2 and T3 showed a significant effect of time ($p < .05$). Contrast analyses revealed significant decreases one month later for all three conditions (360IV: $t = –3.503$; $p < .001$; $d = 1.17$; SP: $t = –2.57$; $p = .013$; $d = 0.55$; CG: $t = –2.089$; $p = .041$; $d = 0.041$).

Self-Reported Empathy

A mixed ANOVA on JSE scores revealed a significant effect of time and an interaction ($p < .05$). Contrast analyses revealed significant decreases for both the 360IV and CG conditions. One month later, mixed ANOVAs did not show any significant results; this was confirmed by contrast analyses, which revealed that increases were maintained one month later (360IV: $t = 0.15$; $p = .879$; CG: $t = 0.22$; $p = .83$).

BBN-Related Self-Efficacy and Stress

A repeated-measures ANOVA displayed a significant effect of time and an interaction (all $ps < .05$) regarding self-efficacy at BBN. Contrast analyses revealed significate increases in the three conditions (all $ps < .05$). Analyses of results one month later were not significant, indicating that the increased self-efficacy was maintained (360IV: $t = -0.30$; $p = .763$; SP: $t = -1.45$; $p = .152$; CG: $t = 0.879$; $p = .383$). Because the interaction was significant, contrast analyses were also done to compare the three conditions at T2. The results revealed that the two experimental conditions did not differ in terms of self-efficacy at T2 ($t = 1.19$; $p = .239$), whereas participants in the control condition scored lower than both experimental groups (SP: $t = -4.01$; $p < .001$; 360IV: $t = -2.504$; $p = .014$).

Regarding stress related to BBN, the repeated-measures ANOVA revealed a significant effect of time and an interaction (all $ps < .05$). Contrast analyses revealed significant decreases in all groups that are maintained in all condition one month later (360IV: $t = 1.007$; $p = .318$; SP: $t = 0.612$; $p = .543$; CG: $t = -0.525$; $p = .602$).

Discussion

The purpose of this study was to test the noninferiority of a new simulation tool (360IV) compared to the reference simulation tool for teaching communication (SP), both provided online to train nursing students in empathic communication skills when discussing bad news. A randomized controlled study was conducted to assess the impact of the training at three levels: measures of empathic communication while discussing difficult news, assessed by an external rater; the empathy and confidence perceived by the patient-actor; and participants' self-reported measures of empathy, stress, and self-efficacy.

The results of this study are mixed. First, promising effects were observed in the 360IV condition for the communication skills associated with the implementation of shared decision-making. Training had a positive effect, with maintenance after one month. Therefore, we suggest that training with a 360° immersive video provided adequate material for a debriefing emphasizing the need to involve the patient in the discussion and ensure that their wishes and concerns were addressed. An increase was also found in the SP condition. Second, the skills needed to improve patient understanding were improved only in the SP condition. This means that more practical, less passive training is needed to increase this competence. Finally, no significant change was observed for the empathic communication subscale. Empathic communication probably requires the development of less procedural, more complex skills that cannot be trained in such a short session. Indeed, empathic communication is a two-way process requiring the professional first to understand and recognize the patient's emotions and feelings, and second to communicate understanding to the patient (Kurtz, Silverman, & Draper, 1998). In summary, both SPIKES-based types of training produced improvements in some communication skills. However, this one-session training was unsatisfactory for improving empathic communication skills. Given these results, it would be interesting to create two kinds of training focusing on different skills: (a) empathic communication such as that developed successfully in previous studies (e.g., Shao et al., 2018); and (b) models for difficult conversations such as the SPIKES. Further studies should explore whether one of these types is a prerequisite for the other.

Another interesting result is that the 360IV condition provided the best results for empathy and confidence as perceived by the patient-actor in the short and long term, whereas the increase was only short-term with SP training. Even more surprising, the control conditions also showed a short-term significant increase in perceived empathy. These results could mean that performing the role-play during the pretest alone was sufficient to improve the quality of the perceived relationship. This improvement could be the result of a simple training effect and a decrease in the novelty effect. In contrast, SP training might contain ingredients that do not facilitate significant improvements, which is surprising and highlights the importance of assessing the impact of SP training on different kinds of outcomes. This method is currently considered to be the most effective, based mainly on self-reported measures (Maclaine et al., 2021). However, the significant correlations found between communication skills and perceived empathy in both experimental conditions, but not in the control condition, suggest that an increase in perceived empathy might be due to the communication skills trained. The increase in perceived empathy in the control group could therefore be explained by elements other than communication skills, such as feeling less distracted by the novelty of the task. Finally, the use of 360° immersive video allowed us to observe an effect that was maintained after one month. This opens up new possibilities for empathy training as 360° immersive video is less costly in terms of human, logistical, and financial resources. However, to allow comprehensive results, 360IV training alone is not sufficient and must be supported by more experiential types of simulation, enabling practical training in the targeted skills.

Finally, the results are mixed regarding self-reported measures. First, increases in self-efficacy in experimen-

tal conditions are consistent with previous studies that report a positive impact of communication skills on self-efficacy among nurses (e.g., Doyle, Copeland, Bush, Stein, & Thompson, 2011; Pehrson et al., 2016; Shao et al., 2018). Second, with respect to global anxiety, a long-term decrease is observed in the 360IV condition only, whereas stress related to BBN decreased over the long term in both experimental conditions. Both types of training seemed to affect stress specifically related to BBN, but the 360IV condition was the only one that decreased symptoms of anxiety. The results regarding the decrease in self-rated empathy scores were unexpected. One hypothesis to be explored is that a confrontation with an emotional patient during the prepost role-plays had a negative impact on empathic attitudes.

Overall, an interesting possibility would be to adopt and assess a hybrid approach in which nursing students would first experience 360IV training, in order to acquire the perspective of a patient receiving bad news, broken with and without good practices. Then they would have the opportunity to practice through simulation with an SP. Indeed, although active learning such as SP training may remain indispensable, possibilities might exist to reduce its use and thus the associated costs by reducing the number of sessions required or potentiating its effect through immersion. This approach should be tested in future studies.

This study has several limits. The first relates to the limitation of ratings by standardized patients, rather than actual patients. This was necessary for ethical reasons, as the participants in this study were students, but further studies should assess the impact of such training on professionals and examine the effect on patients' outcomes. Finally, this study included participants from one university; future studies should replicate this research in other regions or countries as curricula may differ.

Conclusion

This study presents two educational interventions that improved nursing students' empathy, as perceived by patient-actors, as well as their skills related to breaking bad news. The fact that the trainings was given at a distance but still produced these results raises new possibilities to facilitate the implementation of such training because it reduces logistical issues. It seems that both 360° immersive video and standardized patients provide specific benefits: increased perceived empathy and the learning of additional communication skills. These open up new possibilities for communication skills development among nursing students.

Declaration of Competing Interest

The authors have no competing interests to declare that are relevant to the content of this article.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.ecns.2023.101493.

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