Breaking bad news to patients with cancer: A randomized control trial of a brief communication skills training module incorporating the stories and preferences of actual patients

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A B S T R A C T

Objective: This study tested the effectiveness of a brief, learner-centered, breaking bad news (BBN) communication skills training module using objective evaluation measures.
Methods: This randomized control study (N = 66) compared intervention and control groups of students (n = 28) and residents' (n = 38) objective structured clinical examination (OSCE) performance of communication skills using Common Ground Assessment and Breaking Bad News measures.
Results: Follow-up performance scores of intervention group students improved significantly regarding BBN (colon cancer (CC), p = 0.007, r = −0.47; breast cancer (BC), p = 0.003, r = −0.53), attention to patient responses after BBN (CC, p < 0.001, r = −0.74; BC, p = 0.001, r = −0.65), and addressing feelings (BC, p = 0.006, r = −0.48). At CC follow-up assessment, performance scores of intervention group residents improved significantly regarding BBN (p=0.004, r = −0.43), communication related to emotions (p = 0.034, r = −0.30), determining patient's readiness to proceed after BBN and communication preferences (p = 0.041, r = −0.28), active listening (p = 0.011, r = −0.37), addressing feelings (p < 0.001, r = −0.65), and global interview performance (p = 0.001, r = −0.51).
Conclusion: This brief BBN training module is an effective method of improving BBN communication skills among medical students and residents.
Practice implications: Implementation of this brief individualized training module within health education programs could lead to improved communication skills and patient care.

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1. Introduction

Historically patients with cancer were routinely left uninformed regarding their diagnosis [1,2]. This was done largely with the belief that informing patients was harmful and caused undue stress. As cancer treatments improved in the late 1970's, physician-centered models of care evolved to an increased focus on autonomy and most physicians more fully informed their patients about their cancer diagnosis [3]. However, with this change, came new communication challenges to both the patient and the treating physician [4–6].

"Bad news" has been defined by Buckman [7] as, "any news that drastically and negatively alters the patient's view of his or her future." Examples of bad news include: cancer diagnosis, cancer recurrence, and treatment failure. Doctor-patient encounters involving breaking bad news (BBN) are important. When bad news is delivered poorly, it can negatively impact both patient and physician. Negative patient outcomes can include stress and anxiety [8]; miscommunication regarding diagnosis, treatment, and prognosis [9]; and poorer overall health outcomes [10]. Negative physician outcomes can include increased stress [11,12], anxiety [13], and burnout [14].

The Toronto and Kalamazoo Consensus Statements [15,16] made recommendations regarding communication skills in general practice. Recommendations involving challenging communication skills such as those found when delivering bad news were offered by Baile et al. [17] who described a six-step protocol, while Girgis and Swanson-Fisher [20] provided consensus

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guidelines. Training activities for BBN come in a variety of formats. Among these are lecture and small group discussion using role-play and/or standardized patients, instructional videos, and objective structured clinical examinations (OSCEs) [4,17–21].

BBN training is often labor intensive and time consuming, therefore many medical schools provide few formal learning experiences [10,17]. Where BBN training has been reported, these approaches can require up to forty hours [4,22–25].

Initial studies concerning BBN relied largely on participant self-report of increased knowledge and/or confidence while giving bad news [26]. Consequently, conclusions regarding the expression of BBN communication skills were limited. Although they are difficult to create and expensive to implement, OSCEs have been used in several studies [26–28]. More recently, randomized controlled studies evaluating the efficacy of BBN communication skills training have been conducted [25,29–32].

Recognizing these challenges to implementation and education, our study tested the effectiveness of a brief, self-paced, skill-focused BBN training module using objective evaluation measures.

This module was developed using cancer stories from patients. It was the result of an interdisciplinary effort involving faculty from the East Tennessee State University (ETSU) Graduate Storytelling Program and the departments of Family and Internal Medicine.

2. Methods

2.1. Intervention

Training materials for the BBN module were developed using qualitative methods for discovering a variety of challenging experiences reported among patients with cancer. Semi-structured interviews were conducted, video recorded, transcribed verbatim, checked for accuracy by the original interviewer, and analyzed [33,34]. Each interview began with the statement, "Please begin by sharing any stories or personal experiences that might help others to appreciate what it has been like for you to deal with cancer." After a patient shared their story, interviewers asked 1) questions to clarify issues related to communication (e.g. If the

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Breaking Bad News Skills Rating Form Checklist (BBN Skills)

1. **Preamble to Breaking Bad News (gauging patient knowledge and readiness)**
   a. Refers to current "tumor related" or "procedure-related" symptoms [Yes/No]
   b. Checks with how the biopsy-diagnostic procedure went [Yes/No]
   c. Addresses family involvement [Yes/No]
   d. Checks what the patient has been told/knows about the results ("How told" is specific and different from exploring, "how it went.") [Yes/No]
   e. Checks /explores/addresses feelings (must either initiate a dialogue about feelings or explores deeper a feeling statement made by patient. Not just, "How are you feeling?" Must successfully elicit what feelings are present.) [Yes/No]
   f. Checks the patient's readiness to receive the results; how much, and in what amount of detail the patient prefers. [Yes/No]
   g. Premature inquiry regarding patient attributions about cause of symptoms. (reverse scored) [Yes/No]
   h. Distracting leads such as lengthy ice-breakers or "beating around the bush" (reverse scored) [Yes/No]

2. **Breaking Bad News**
   a. Provides forewarning [Yes/No]
   b. Expresses personal regrets [Yes/No]
   c. Makes a positive personal statement [Yes/No]
   d. Makes statement using the term "cancer" [Yes/No]
   e. Uses ambiguous or obscuring modifier such as "highly suspicious," "may represent." [reverse scored] [Yes/No]
   f. Uses non-specific lay terms (mass, growth, tumor) instead of the word, "cancer." [reverse scored] [Yes/No]

3. **Attention to Patient Responses after BBN**
   a. After stating "cancer", immediately proceeds to providing additional information re: cancer details, treatment, prognosis, etc." [reverse scored] [Yes/No]
   b. Explicitly asks about patient reactions [Yes/No]
   c. Responds non-verbally to non-verbal expression [Yes/No]
   d. Explores personally charged verbal clues [Yes/No]
   e. Asks about experience and/or knowledge regarding cancer. [Yes/No]

4. **Communication Related to Patient Emotions**
   a. Asks about feelings [Yes/No]
   b. Acknowledges patient feeling without specifically naming it [Yes/No]
   c. Names/restates/hypothesizes or acknowledges a specific feeling [Yes/No]
   d. Touches patient supportively [Yes/No]
   e. Discourages expressions of feelings, "Don't worry…Be a fighter"…"Be strong" [reverse scored] [Yes/No]

5. **After BBN Determines Patient Readiness to Proceed and Communication Preferences**
   a. Asks about readiness to proceed [Yes/No]
   b. Asks about preference to involve family member, if needed [Yes/No]
   c. Preference for type of information – General (qualitative) vs. Specific (graphs, tables, percentages) [Yes/No]
   d. Asks about preference for prognosis timeline (General vs. Percentages, months)[Yes/No]
   e. Discloses prognosis (either General or Specific) [Yes/No]
   f. Provides medical recommendations direction (the next step will be…on diagnosis, work-up, and or TX. (If postpones further discussion until family or patient is ready mark N/A.) [Yes/No]

Fig. 1. Breaking Bad News Skills Rating Form Checklist (BBN Skills).

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patient did not spontaneously mention something such as how the diagnosis was given, then the interviewer would inquire.) and 2) questions based on previous research and communication consensus reports (e.g. breaking bad news, end-of-life, decision-making, spirituality, etc.).

Transcripts were independently examined by at least two reviewers. Key concepts and themes that emerged from the data were coded. These reviewers compared and contrasted their independent coding and came to a consensus regarding the emerging themes. Following guidelines suggested by Kuzel [35], theme saturation was achieved after approximately 15 interviews. It was important from a pedagogic perspective that a representative variety of cancer types and exemplary quotes be obtained. Accordingly, a total of 112 interviews were transcribed, coded, and entered into NVivo 8 qualitative data analysis software [36].

Reliability and validity were maximized using four maneuvers: 1) interviews were transcribed verbatim, 2) interviewers took field notes during interviews to improve accuracy of data interpretation, 3) at least two reviewers independently examined and analyzed the data before this was presented to the module development team, and 4) member checking occurred for a sub-sample of the interview participants and the research team met for further synthesis and interpretation of the themes. This approach determined relationships between themes and provided exemplar quotes demonstrating the themes. The research team used these themes and quotes to develop the modules.

Five main themes emerged: 1) breaking bad news, 2) living through treatment, 3) palliative care and end-of-life care, 4) spirituality, and 5) family. Each theme became the emphasis of a training module designed to improve communication skills with

Fig. 2. Common Ground Assessment.

3. Addressing Feelings with Patient

No   Yes   N/A   PT's stated or implied feelings needing follow up.
O   O   O   **#1 Anxious # 1**
O   O   O   **#2 Anxious # 2**
O   O   O   **#3 Worst thing-empathic response**
O   O   O   **#4-- Sigh**

(Number of Occurrences)

0   1   2   3   4   Acknowledges -Explore other feelings..
O   O   O   O   O   SPECIFY BELOW

(Rating Scale)
1   2   3   4   5   NA   Overall Deals with Feelings
O   O   O   O   O   O

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4. Closing the Interview

(Rating Scale)

No   1   2   3   N/A
O   O   O   O   O   Identifies **patient's perspective** (What
                         patient knows, concerns, expectations) and
                         builds INDIVDIDUAL plan accordingly:
                         No = Little or not at all;
                         1= Partially, 2 = Adequately; 3 = Notably
O   O   O   O   O   **Explains Impressions** (Dx, Tx, options):
                         No = Strikingly ineffective, 1= Somewhat
                         ineffective, 2 = Effective, 3 = Notably
                         effective
O   O   O   O   Checks for **agreement/feasibility**
                         No = None, 1 = Minimal, 2 = Effective
O   O   O   O   Checks for **understanding**
                         No = None, 1 = Yes/No, 2 = Teach back
O   O   O   O   Establishes **mutual responsibility**
                         No = None, 1 = Partial, 2 = Thorough

(Rating Scale)
1   2   3   4   5   NA   Overall Closing
O   O   O   O   O   O
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5. Global Interview Performance

(Rating Scale)

1   2   3   4   5   NA   Overall Global
O   O   O   O   O   O   **Interview**

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Fig. 2. (Continued)

patients with cancer. These modules were designed to be brief (60 min) and to actively engage learners. Interactivity between learners and modules was enhanced through video clips of patients, physicians, and family in the introduction of various communication skills. They also reinforced content themes, and evoked patient-centered, empathic responses among learners. These clips were selected by their authors as being salient to the goals and learning objectives of respective training modules.

The BBN module incorporated recommendations found within the literature [4,17,20,21] as well as selected video recordings of twenty-seven actual cancer patients who described challenging communications situations involving BBN. For example, one video clip presented a female patient who described feelings of shock, fear, and confusion upon hearing that she had cancer during the "delivery phase" [37] of this encounter. During this time she reported experiencing a "deafening silence". This intense emotional response limited her ability to process information. This video clip highlighted the importance of pausing after delivering bad news in order to attend to a patient's emotional response before sharing additional information. In order to keep learners engaged, quiz questions were included every 5–10 min. Quizzes asked learners to imagine how they would respond to a patient in a challenging communication situation: "How would you respond to this patient? What would you say and do?" Simulated patient interviews using actors portraying doctors and patients were included to help learners identify effective communication skills during doctor-patient interactions. Annotations were used to emphasize communication techniques. Learners viewed the training module on a CD-ROM or website. Viewing time averaged 60 min.

Timeline: Data Collection and Intervention

Time	Residents	Time	Students
Day 1	1) Colon Cancer baseline OSCE (all residents) ⇩	Day 1	1. Colon CA and Breast CA baseline OSCEs (all students) ⇩
Within 7 days of baseline OSCE	2) BBN training module (intervention group only) ⇩	Within 7 days of baseline OSCEs	2. BBN training module (intervention group only) ⇩
		14 days after baseline OSCE	3. Colon CA and Breast CA follow-up OSCEs (all students) ⇩
		Within 7 days of follow-up OSCEs	4. BBN training module (control group only)
Approx 31 days after baseline OSCE)	3) Colon Cancer follow-up OSCE (all residents) ⇩		
Within 7 days of follow-up OSCE	4) BBN training module (control group only)		

Demographics

Residents (N = 38)				Students (N = 28)			
	Colon Cancer OSCE n (%)				Colon and Breast OSCEs n (%)		
	intervention group	control group	total		intervention group	control group	total
Female	10 (56)	8 (44)	18 (47)	Female	7 (58)	5 (42)	12 (43)
Male	10 (50)	10 (50)	20 (53)	Male	8 (50)	8 (50)	16 (57)
			38 (100)				28 (100)
Caucasian	12 (57)	9 (43)	21 (55)	Caucasian	12 (50)	12 (50)	24 (86)
Asian	8 (57)	6 (43)	14 (37)	Asian	2 (100)	0 (0)	2 (7)
Hispanic	0 (0)	2 (100)	2 (5)	Black	1 (50)	1 (50)	2 (7)
Native American	0 (0)	1 (100)	1 (3)				28 (100)
			38 (100)				
Family Med (R1)	18 (51)	17 (49)	35 (92)	Med students (M1)	9 (50)	9 (50)	18 (64)
Internal Med (R1)	2 (67)	1 (33)	3 (8)	Pharmacy students	3 (43)	4 (57)	7 (25)
			38 (100)	Nursing students	3 (100)	0 (0)	3 (11)
							28 (100)
	M (SD)				M (SD)		
Age by group	29.4 (4.76)	29.8 (4.07)	29.6 (4.39)	Age by group	23.5 (3.02)	26.9 (7.17)	25.4 (5.80)

Fig. 3. Data Collection Timeline and Demographics.

2.2. Case scenarios

The widely used OSCE format was chosen because it allowed for the simulation of multiple doctor-patient meetings in a standardized setting. It has demonstrated good reliability and validity with medical encounters found in general practice [38,39]. The OSCEs used in this study involved challenging scenarios found when delivering bad news with particular attention to communication skills recommended through consensus statements and guidelines specific to cancer [17,20,40]. Two 15-min OSCE stations (breast cancer and colon cancer) were developed.

2.3. OSCE standardized patients and raters

Standardized patient (SP) OSCE training was conducted by ETSU's SP Coordinator. SPs who delivered at least 90% of the OSCE clues accurately were assigned to the BBN OSCE. This level of reliability is similar to those reported in previous studies [39,41,42]. Each OSCE lasted approximately 15 min (7 min of chart review and 8 min of female SP interview). Three independent raters were recruited from this pool of SPs. Raters were assigned OSCE video recordings after they reached an a priori accuracy of 90%. Raters were blind to the participant's level of education, the OSCE interview sequence (baseline or follow-up), and group status (intervention or control).

2.4. OSCE evaluation measures

Communication skills were assessed using performance ratings in two OSCE scenarios. Two communication skills rating forms were used: the Breaking Bad News Skills rating form checklist (BBN Skills) which is a measure of specific BBN-related skills and the Common Ground Assessment Summary form (CGAS) [39], a validated measure of general communication skills.

Fig. 1 displays the BBN Skills form, a checklist comprised of five measures. Each measure is composed of several checklist items (no = 0, yes = 1) corresponding to the BBN training module learning objectives. The five measures are: 1. Preamble to Breaking Bad News (gauging patient knowledge and readiness), 2. Breaking Bad News, 3. Attention to Patient Responses after BBN, 4. Communication Related to Patient Emotions, and 5. After BBN Determines Patient Readiness to Proceed and Communication Preferences. The Preamble to Breaking Bad News measures the introduction portion of the interview in the context of a BBN visit. It determines whether and how an interviewer might avoid difficult issues. Breaking Bad News focuses on skills used while the bad news is delivered, but before the interview transitions into the information-sharing stage. It assesses whether forewarnings are used as well as how the bad news is expressed. Attention to Patient Responses after BBN examines interviewer's interactive behaviors related to patient's prior experiences, emotions, thoughts, and preferences before providing additional medical information. Communication Related to Patient Emotions determines whether and how the interviewer addressed emotions expressed by the SP throughout the OSCE. After BBN, Determines Patient Readiness to Proceed and Communication Preferences examines interview skills related to timing and the exploration and incorporation of patients' communication preferences, including the involvement of family or other supportive persons.

The CGAS (Fig. 2) contains five summary scales (Overall Rapport, Overall Active Listening, Overall Deals with Feelings, Overall Closing, and Overall Global Interview). Lang et al. [39] reported that this measure provided "a reliable and valid assessment of patient-centered communications skills for everyday office visits, consistent with the expectations of the Toronto and Kalamazoo consensus statements." The CGAS scales use a 5-point rating (1 = needs improvement, 2 = marginal, 3 = competent/adequate, 4 = very effective, 5 = exemplary). As a means of increasing precision, raters were instructed to score half-point increments between rating points described by the scale.

2.5. Research participants and procedure

The ETSU Institutional Review Board approved this study. All patient participants provided their written consent to use their personal cancer stories and experiences that demonstrate effective and ineffective cancer communication as part of educational modules to educate doctors to communicate more effectively with cancer patients.

A volunteer group of health professional students who were paid $100 participated in this study. They were enrolled in the colleges of medicine, pharmacy, or nursing and had completed the Communications Skills for Health Professionals course. A second group of participants was comprised of family medicine and internal medicine residents who completed the OSCEs as part of their usual academic exercises at the beginning of their first year of training. Their prior experience with communications skills training was unknown. The students and residents provided their written consent to video-record OSCE sessions with a standardized patient, and to complete a training module and a quiz on communication effectiveness.

All 66 participants were randomly assigned to either an intervention group or a waiting list control group (Fig. 3). To control for a possible order effect, students received a counterbalanced presentation of the OSCE (breast vs. colon cancer). The students assigned to the intervention arm of this study received the follow-up OSCE within seven days of their completion of BBN training module. The training of students in the control group was delayed for two weeks. Residents received the colon cancer scenario in both the baseline and follow-up OSCE. Residents assigned to the intervention group completed the training module one week after they completed the baseline OSCE and the follow-up OSCE within one month of the baseline OSCE. Training was delayed for residents assigned to the control group. They received each OSCE, spaced one month apart, before receiving the training module. OSCEs were rated using the CGAS and the BBN Skills Form. Differences in length of time between baseline OSCEs and follow-up OSCEs for students and residents were due to scheduling limitations within the residency programs and student availability. Ideally, students would have been assessed on schedule with residents (30 days between baseline and follow-up).

2.6. Analysis

The measures comprised within the BBN Skills Form were developed by summing the categorical checklist items within each of the scales. Although less than one percent of the data was missing, where this did occur, missing data from within the BBN Skills measures were imputed using the formula: (sum score of scale/number of valid items in scale multiplied by the number of total expected items in scale). Change scores for each measure were determined by subtracting the baseline OSCE score from the follow-up OSCE score. Mann-Whitney U tests were employed to compare change scores found between the intervention and control groups. The direction of change between intervention and control groups was hypothesized to be positive for all measures, so all statistical tests examining OSCE performance were one-tailed with an alpha level of 0.05. Effect sizes were calculated to determine the magnitude of the differences between baseline scores and follow-up scores. All statistical tests on demographic characteristics were two-tailed with an alpha level of 0.05. The analyses were performed with SPSS version 21 for PC [43].

Table 1
BBN OSCE Results for Students and Residents.

BBN Colon Cancer and Breast Cancer OSCEs for Students (N = 28)

Rating Scale	Control Group n = 13				Intervention Group n = 15				Mann-Whitney test Change Scores: Control vs. Intervention			
	baseline M (SD)	follow-up M (SD)	change score	Change Scores Mean rank	baseline M (SD)	follow-up M (SD)	change score	change scores mean rank	U	Z	r (effect-size)	p
Colon – BBN Skills Rating Form												
1. Preamble to Breaking Bad News	2.31 (.48)	2.31 (.63)	0.00	12.15	2.43 (.76)	2.80 (.86)	0.37	15.71	67.00	−1.31	−0.25	0.095
2. Breaking Bad News	3.38 (.77)	3.27 (.97)	−0.11	9.92	3.54 (1.05)	4.60 (.74)	1.06	17.08	38.00	−2.48	**−0.47**	**.007****
3. Attention to Patient Responses After BBN	2.29 (1.22)	2.25 (.1.27)	−0.04	7.96	1.57 (1.55)	3.38 (1.24)	1.81	19.61	12.50	−3.92	**−0.74**	**<.001*****
4. Communication Related to Patient Emotions	2.69 (.95)	2.85 (.99)	0.16	14.54	3.14 (1.23)	3.23 (1.14)	0.11	13.50	84.00	−0.36	−0.07	0.361
5. After BBN, Determines Patient Readiness to Proceed and Communication Preferences	3.40 (1.32)	3.23 (1.22)	−0.17	11.65	2.67 (1.39)	3.27 (1.46)	0.60	16.18	60.50	−1.49	−0.28	0.069
Colon – Common Ground Assessment Scales												
1. Rapport	2.54 (.69)	2.65 (.92)	0.11	13.31	2.89 (.66)	3.13 (.58)	0.24	14.64	82.00	−0.45	−0.09	0.325
2. Active Listening	2.81 (.48)	2.92 (.40)	0.11	11.65	2.64 (.66)	3.07 (.55)	0.43	15.35	60.50	−1.31	−0.25	0.095
3. Addressing Feelings with Patient	2.77 (.56)	3.08 (.45)	0.31	13.88	3.04 (.80)	3.32 (.42)	0.24	13.12	79.50	−0.27	−0.05	0.392
4. Closing the Interview	2.58 (.61)	2.85 (.66)	0.27	12.50	2.75 (.55)	3.20 (.56)	0.45	15.39	71.50	−0.99	−0.19	0.163
5. Global Interview Performance	2.50 (.58)	2.65 (.77)	0.15	11.81	2.82 (.72)	3.25 (.55)	0.43	15.19	62.50	−1.16	−0.22	0.123
Breast – BBN Skills Rating Form												
1. Preamble to Breaking Bad News	2.74 (1.64)	2.53 (.66)	−0.21	14.00	2.53 (.64)	2.80 (.86)	0.27	14.93	91.00	−0.33	−0.06	0.371
2. Breaking Bad News	2.92 (1.19)	3.46 (.66)	0.54	10.00	2.73 (1.22)	4.73 (.59)	2.00	18.40	39.00	−2.78	**−0.53**	**.003****
3. Attention to Patient Responses After BBN	2.98 (.89)	2.90 (1.47)	−0.08	8.85	1.61 (1.11)	4.02 (1.01)	2.41	19.40	24.00	−3.43	**−0.65**	**.001****
4. Communication Related to Patient Emotions	3.23 (.73)	3.38 (1.12)	0.15	11.69	3.07 (.96)	4.13 (.99)	1.06	16.93	61.00	−1.72	**−0.33**	**.043***
5. After BBN, Determines Patient Readiness to Proceed and Communication Preferences	2.98 (1.35)	3.10 (1.42)	0.12	12.19	2.17 (1.17)	3.43 (1.62)	1.26	16.50	67.50	−1.39	−0.26	0.083
Breast – Common Ground Assessment Scales												
1. Rapport	2.62 (.68)	2.85 (.83)	0.23	13.00	2.87 (.61)	3.40 (.66)	0.53	15.80	78.00	−0.92	−0.17	0.179
2. Active Listening	2.88 (.42)	3.04 (.66)	0.16	12.42	2.57 (.56)	3.10 (.57)	0.53	16.30	70.50	−1.29	−0.24	0.099
3. Addressing Feelings with Patient	3.35 (.47)	3.31 (.63)	−0.04	10.58	3.10 (.47)	3.73 (.56)	0.63	17.90	46.50	−2.53	**−0.48**	**.006****
4. Closing the Interview	2.69 (.52)	2.96 (.72)	0.27	13.23	2.90 (.66)	3.40 (.83)	0.50	15.60	81.00	−0.785	−0.15	0.216
5. Global Interview Performance	2.62 (.55)	2.92 (.86)	0.30	11.92	2.80 (.56)	3.50 (.53)	0.70	16.73	64.00	−1.58	−0.30	0.057

BBN Colon Cancer OSCE for Residents (N = 38)

Rating Scale	Control Group n = 18				Intervention Group n = 20				Mann-Whitney test Change Scores: Control vs. Intervention			
	baseline M (SD)	follow-up M (SD)	change score	Change Scores Mean rank	baseline M (SD)	follow-up M (SD)	change score	change scores mean rank	U	Z	r (effect-size)	p
Colon – BBN Skills Rating Form												
1. Preamble to Breaking Bad News	2.92 (.80)	3.63 (.97)	0.71	21.39	3.28 (1.10)	3.61 (1.12)	0.33	17.80	146.00	−1.02	−0.17	0.153
2. Breaking Bad News	3.86 (1.11)	3.61 (1.14)	−0.25	14.58	3.80 (.89)	4.85 (.88)	1.05	23.93	91.50	−2.67	**−0.43**	**0.004****
3. Attention to Patient Responses After BBN	2.04 (1.24)	2.42 (1.35)	0.38	18.92	2.28 (.85)	2.94 (1.17)	0.66	20.03	169.50	−0.31	−0.05	0.378
4. Communication Related to Patient Emotions	3.01 (1.00)	3.31 (.71)	0.30	16.11	2.79 (.82)	3.74 (1.11)	0.95	22.55	119.00	−1.83	**−0.30**	**0.034****
5. After BBN, Determines Patient Readiness to	2.46 (1.26)	2.61 (.79)	0.15	16.19	2.73 (.94)	3.56 (1.27)	0.83	22.48	120.50	−1.74	**−0.28**	**0.041***

Table 1 (Continued)

BBN Colon Cancer OSCE for Residents (N = 38)											
	Control Group n = 18				Intervention Group n = 20				Mann-Whitney test Change Scores: Control vs. Intervention		
Rating Scale	baseline M (SD)	follow-up M (SD)	change score	Change Scores Mean rank	baseline M (SD)	follow-up M (SD)	change score	change scores mean rank	U	Z	r (effect-size)	p
Proceed and Communication Preferences												
Colon – Common Ground Assessment Scales												
1. Rapport	3.14 (.64)	3.14 (.56)	0.00	16.61	3.18 (.52)	3.48 (.77)	0.30	22.10	128.00	−1.60	−0.26	0.056
2. Active Listening	2.44 (.45)	2.50 (.49)	0.06	15.22	2.55 (.58)	3.23 (.70)	0.68	23.35	103.00	−2.31	**−0.37**	**0.011****
3. Addressing Feelings with Patient	3.06 (.45)	2.94 (.34)	−0.12	12.17	3.08 (.47)	3.80 (.59)	0.72	26.10	48.00	−3.99	**−0.65**	**<0.001*****
4. Closing the Interview	3.00 (.35)	2.94 (.50)	−0.06	13.44	2.95 (.65)	3.63 (.60)	0.68	23.73	75.50	−2.98	**−0.48**	**0.002****
5. Global Interview Performance	2.89 (.40)	2.97 (.32)	0.08	13.86	2.80 (.66)	3.55 (.71)	0.75	24.58	78.50	−3.12	**−0.51**	**0.001****

Note: $^*p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$. All tests were one-tailed.

3. Results

3.1. Participant demographic data and baseline assessment

The student group of 12 females and 16 males had an average age of 25.4 (Fig. 3). As is typical of the demographic makeup of this region, most of this group self-identified as Caucasian (86%). Two students self-identified as Asian (7%) and two students Black (7%). No significant within group differences were detected based on student age [t (19.37) = 1.67, $p = 0.111$] or gender [χ^2 (1) = 0.191, $p = 0.662$].

The resident group, 20 males and 18 females had an average age of 29.6. Twenty-one members of this group self-identified as Caucasian (55%), 14 Asian (37%), 2 Hispanic (5%), and 1 Native American (3%). A comparison of the intervention and the control groups of the residents, yielded no significant differences based on age [t (34) = −0.27, $p = 0.788$] or gender [χ^2 (1) = 0.12, $p = 0.732$]. However, residents were significantly older than students [t (62) = 3.34, $p = 0.001$] and were more likely to claim a non-Caucasian ethnic identifier [χ^2 (1) = 6.89, $p = 0.009$].

Table 2 provides a baseline assessment and comparison of students and residents using the BBN Skills rating measures and the Common Ground Assessment. Residents scored significantly higher than students on two of the ten measures: Preamble to Breaking Bad News ($p < 0.001$) and Rapport ($p = 0.015$).

3.2. Effects of BBN training on student and resident OSCE performance

Most OCSE change scores of students were significantly higher for the intervention group as compared to the control group. Statistically significant differences were found in both the colon and the breast cancer OSCEs (Table 1). On the colon cancer OSCE, significant improvement was found on two of the BBN Skills measures: Breaking Bad News ($p = 0.007$; effect size $r = −0.47$) and Attention to Patient Responses after BBN ($p < 0.001$; $r = −0.74$). On the breast cancer OSCE, significant improvement was found on three of the BBN Form measures: Breaking Bad News ($p = 0.003$; $r = −0.53$), Attention to Patient Responses after BBN ($p = 0.001$; $r = −0.65$), and Communication Related to Patient Emotions ($p = 0.043$; $r = −0.33$). Using the CGAS, the Addressing Feelings scale was significantly higher in the intervention group on the breast cancer OSCE ($p = 0.006$; $r = −0.48$). Although students who received the breast cancer OSCE had significantly higher scores than the control group on the Communication Related to Patient Emotions and Addressing Feelings with Patient scales, these differences were not significant with students who completed the colon cancer OSCE.

Among residents, most of the BBN Skills and CGAS scales were significantly higher for the intervention group than the control group. Using the colon cancer OSCE, three of the five BBN Skills measures were significantly higher in the intervention group:

Table 2
Comparison between Student Group and Resident Group Baseline Scores on BBN Rating Form Scales and Common Ground Assessment (CGAS).

Rating Scale	Students N = 28		Residents N = 38					
	Baseline scores M (SD)	Mean rank	Baseline scores M (SD)	Mean rank	U	Z	r (effect-size)	p
Colon – BBN OSCE Rating Form Scales								
1. Preamble to Breaking Bad News	2.37 (0.63)	23.35	3.11 (0.97)	39.86	252.50	−3.66	−0.45	<0.001***
2. Breaking Bad News	3.46 (0.90)	28.10	3.83 (0.99)	35.51	379.50	−1.65	−0.20	0.100
3. Attention to Patient Responses After BBN	1.92 (1.43)	30.65	2.16 (1.04)	34.67	449.50	−0.871	−0.11	0.384
4. Communication Related to Patient Emotions	2.93 (1.11)	33.57	2.89 (0.90)	32.59	497.50	−0.217	−0.03	0.828
5. After BBN, Determines Patient Readiness to Proceed and Communication Preferences	3.02 (1.38)	34.89	2.60 (1.09)	31.66	462.00	−0.690	−0.08	0.491
Colon – Common Ground Assessment Scales								
1. Rapport	2.72 (0.68)	26.41	3.16 (0.57)	37.68	335.00	−2.44	−0.30	.015*
2. Active Listening	2.72 (0.58)	37.15	2.50 (0.52)	30.05	401.00	−1.55	−0.19	0.121
3. Addressing Feelings with Patient	2.91 (0.69)	29.83	3.07 (0.45)	35.25	427.50	−1.20	−0.15	0.229
4. Closing the Interview	2.67 (0.57)	27.74	2.97 (0.53)	35.97	371.00	−1.86	−0.23	0.063
5. Global Interview Performance	2.67 (0.67)	29.52	2.84 (0.55)	35.47	419.00	−1.31	−0.16	0.198

Note: $^*p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$. All tests were two-tailed using Mann-Whitney U test.

Breaking Bad News ($p = 0.004$; $r = -0.43$), Communication Related to Emotions ($p = 0.034$; $r = -0.30$), and After BBN, Determines Patient Readiness to Proceed and Communication Preferences ($p = 0.041$; $r = -0.28$). The resident intervention group also had significantly higher scores on four of the five CGAS scales: Active Listening ($p = 0.011$; $r = -0.37$), Addressing Feelings with Patients ($p < 0.001$; $r = -0.65$), Closing the Interview ($p = 0.002$; $r = -0.48$), and Global Interview Performance ($p = 0.001$; $r = -0.51$).

4. Discussion and conclusion

4.1. Discussion

This study evaluated the effectiveness of a brief (60 min) BBN communication training module with students and residents. Communication skills of both student and resident intervention group participants significantly improved in a variety of areas. These included skills which occurred during the initial moments of breaking bad news, the provision of forewarnings before BBN, attention to patient responses immediately after BBN, using the word "cancer" rather than vague terms like "growth" or tumor", communication related to emotions, determining readiness to proceed, assessing for preferred method of communication, active listening, and closing the interview (identifying patient perspective, explaining impressions, checking for agreement understanding and feasibility, and establishing mutual responsibility). The effect sizes for these improvements ranged from medium to large, suggesting that this brief BBN module can be an effective method for teaching students and residents.

While improvement was demonstrated in most skill areas, some differences were found between students and residents. For example, after training, residents improved active listening skills, were more likely to address patient emotions, and to close the interview effectively by identifying patient perspectives, explaining impressions, establishing mutual responsibility, and checking for understanding, agreement, and feasibility. Residents did not significantly improve on a measure assessing attention to patient responses after breaking bad news. On the other hand, health professional students who completed the BBN module were significantly more likely to wait or pause after the initial announcement that bad news was to follow and were more likely to explicitly ask about how the patient felt after bad news was delivered. Students who used the module were more likely to explore for possible underlying emotions expressed verbally and nonverbally by the OSCE patient. Differences between residents and students may have been because many of the residents trained at foreign medical schools which provided little or no communication skills training. Cultural differences may also have played a role in preferences for communication approaches.

While students significantly improved on the BBN and the Attention to Patient Responses scales using both the colon and breast cancer OSCE, there were some differences based on the type of OSCE used. For example, student performance improved on two sets of skills related on the breast cancer OSCE, but not on the colon cancer OSCE. Both sets of skills were related to patient emotions (Addressing Feelings scale) and Communication Related to Patient Emotions (asking about feelings, acknowledging feelings without specifically identifying the feeling, naming or hypothesizing feelings, and using touch effectively). In addition to unknown differences between these OSCEs, there is the possibility that, because of age similarities or cancer's relative frequency of occurrence, students may have felt greater empathy with standardized patients portraying breast cancer than for the standardized patients depicting colon cancer.

Because of additional training and maturation associated with life and clinical practice experiences, baseline communication skills of residents were anticipated to be higher than those of students. However, baseline scores for residents were higher than students on but two of ten measures (Preamble to BBN and Rapport). This may have been because residents did not attend a medical school where communication training was stressed. Indeed, many residents in this study received their medical school education in foreign medical schools, and have informally reported that communication skills were taught casually and episodically at the bedside during hospital rounds. Another consideration is baseline score differences might have been associated with selection bias: the student group was comprised of volunteers who, recently completing a communication skills course, may also have had special interest in this topic.

This study has several strengths. It is a randomized control trial design which, used a standardized, reproducible, and brief (60 min) training module that incorporated video-recorded stories from patients who shared their experiences specific to cancer as well as their preferences for communication with physicians. In addition, this study used objective performance measures: standardized patients and OSCEs. Effect-sizes of results are included, which permits interpretability regarding the magnitude of change [44,45] between baseline and follow-up OSCEs. The BBN module is learner-centered, self-paced, and designed for the training of advanced interviewing skills. Like similar studies [25,29–32], items comprising the BBN Skills are largely based on suggestions from existing literature, expert opinion, and consensus statement guidelines.

This study has several limitations. Generalizability of CGAS results may be limited. Lang et al. [39] found that five OSCEs achieved a high generalizability coefficient of 0.80, whereas, due to time constraints, this study used but two OSCE cases. Secondly, sample size limitations prevented the use of factor analysis, an approach that may have led to the development of more precise assessment measures. On the other hand, the BBN Skills measures used in this study do possess a high degree of face validity and focus on observable BBN skills measured using a simple "yes or no" checklist. Additionally, consistent with previous studies [25,29–32], BBN Skills items are based on expert opinion, suggestions from existing literature, and consensus statement guidelines. A third limitation is that selection bias may exist among students. Unlike residents, students volunteered and were not required to participate as part of their regular educational coursework. Some students may have participated due to an interest in learning additional communication skills. However, students received a $100 payment which may have incentivized some individuals who would not have normally participated without it, thereby diversifying the student group and likely mitigating self-selection bias introduced by volunteers whose primary motivation was learning new communication skills. Students had just completed training on basic, core communications skills; however these authors are uncertain regarding specific previous communications skills training among residents.

Table 3 compares methods and relevant findings from our study with several others [25,29–32]. Our study used a self-guided module, whereas most others [25,29,31,32] used a combination of lecture, small group learning, role-playing, and feedback. One study [31] used a self-directed training similar to our own; however their method incorporated feedback sessions, whereas ours did not. Our study tested students and residents, whereas others tested medical residents or mid-career oncologists. Our training used minimal time (1 h) and resources, where others used more (1.3 h–40 h).

Our results are consistent with findings of other studies in the literature. Previously developed interventions [25,29–32] have noted significant improvement in aspects of communication related to empathy. Additionally, Deatwyler and colleagues [30]

Table 3
Summary Comparison of BBN Communication Skills Training Incorporating OSCEs and Randomized Control Design.

Authors	Training Method	Participants	Highlights of Significant Results (Note: Areas of overlap between improvements in communication skills demonstrated in our study and other studies are italicized. Bracketed numbers after skill items correspond to similar skills assessed by our measures.)
Gorniewicz, Floyd, Krishnan, Bishop, Tudiver, and Lang (2016)	Self-directed PowerPoint-based training module incorporating cancer patient videos (1 h) Total time: 1 h	Students (medical, nursing, and pharmacy) and Medical Residents (family medicine and internal medicine)	**Student group** Colon cancer OSCE: 1. Breaking Bad News ($p = 0.007$; effect size $r = -0.47$) 2. Attention to Patient Responses after BBN ($p < 0.001$; $r = -0.74$) Breast cancer OSCE: 1. Breaking Bad News ($p = 0.003$; $r = -0.53$) 2. Attention to Patient Responses after BBN ($p = 0.001$; $r = -0.65$) 3. Communication Related to Patient Emotions ($p = 0.043$; $r = -0.33$) 4. Addressing Feelings with Patient ($p = 0.006$; $r = -0.48$) **Medical Resident group** Colon cancer OSCE 1. Breaking Bad News ($p = 0.004$; $r = -0.43$) 2. Communication Related to Emotions ($p = 0.034$; $r = -0.30$) 3. Addressing Feelings with Patients ($p < 0.001$; $r = -0.65$) 4. After BBN, Determines Patient Readiness to Proceed and Communication Preferences ($p = 0.041$; $r = -0.28$) 5. Active Listening ($p = 0.011$; $r = -0.37$) 6. Closing the Interview ($p = 0.002$; $r = -0.48$) 7. Global Interview Performance ($p = 0.001$; $r = -0.51$)
Lienard, Merckaert, Libert, et al. [25]	Lecture and small groups w/role-playing and feedback Total time: 40 h	Medical Residents	*Open question* [6] *($p < 0.001$; RR = 5.79)* *Open directive questions* [6] *($p = 0.003$; RR = 1.71)* *Empathy* [2,4] *($p = 0.017$; RR = 4.50)* *Fewer medical words* [1] *($p < 0.001$; RR = 0.74)* Less information transmission ($p = 0.001$; RR = 0.72)
Szmuilowicz, el-Jawahri, Chiappetta, et. al [29]	Lecture and small groups w/role playing and feedback Total time: 5 h	Medical Residents (internal medicine PGY 2)	*Responding to emotion – overall score* [2–4] *($p = 0.03$)*
Daetwyler, Cohen, Gracely, et. al [30]	doc.com online BBN module (1 h) + WebEncounter OSCE (10 min) w/ feedback (10 min) Total time: 1.3 h	Medical Residents	*BBN skills checklist summary score* [1–7] *($p = 0.018$)*
Merckaert, Lienard, Libert, et. al [31]	Lecture and small groups, role-playing and feedback (30 h) + stress management training (10 h) Total time: 40 h	Medical Residents (oncology, gynecology, and others)	*Supportive utterances: acknowledgement* [2,4] *($p < 0.001$; RR = 1.58)* *Open directive questions* [6] *($p < 0.001$; RR = 2.14)* *Decrease in use of medical words by residents* [1] *($p < 0.001$; RR = 0.81)* *Checking questions* [7] *($p = 0.034$; RR = 1.66)* Decrease in procedural information utterance by residents ($p < 0.047$; RR = 0.83) Longer "pre-delivery phase" ($p < 0.001$; RR = 3.04) Shorter "post-delivery phase" ($p < 0.001$; RR = 0.93)
Fujimori, Shirai, Asai, et. al [32]	Orientation/ice-breaker (30 min) + lecture w/videos (1 h) + small group role plays w/ discussion (8 h) + summary session (30 min) Total time: 10 h	Oncologists (10 years of experience on average)	*Not beginning bad news without preamble* [1] *($p < 0.001$)* *Checking to see that patient understands bad news* [2,7] *($p = 0.008$)* *Communicating clearly main points of bad news* [1] *($p = 0.011$)* *Checking questions* [7] *($p = 0.045$)* *Providing reassurance and addressing patient's emotions with empathic Responses* [2–4,6] *($p = 0.011$)* *Remaining silent out of concern for patient's feelings* [2] *($p = 0.005$)* *Accepting patient's expression of emotions* [3] *($p < 0.001$)* *Using words that soothe patient* [2–] *($p = 0.005$)* Considering how to deliver bad news ($p = 0.001$) Setting up supportive environment for interview ($p = 0.002$) Greeting patient cordially ($p < 0.001$) Asking how much patient knows about his or her illness before breaking bad news ($p = 0.024$) Checking to see whether talk is fast paced ($p = 0.005$) Providing information on services and support ($p = 0.002$) Explaining second opinion ($p = 0.012$)

reported overall improvement in BBN skills using a checklist rating form with items similar to our own rating form (Fig. 1).

Unique to our study is the successful implementation of a self-directed training module that 1) does not require expert feedback in order to improve communication skills, 2) incorporates memorable and emotionally resonant video-recorded stories from patients with cancer, 3) requires less time and resources than other training methods, and 4) is effective with student learners.

4.2. Conclusion

Our results demonstrate that students and residents who used this module significantly improved their communication skills based upon measures designed to assess skill acquisition in a variety of areas. Future research could examine the effectiveness of using this module in other educational training settings. This study used individual, self-paced learning for training. It is unknown whether other settings, such as a small group led by a facilitator or a short lecture/discussion, would yield similar results. There is also a need for future research examining the effectiveness for each of the four other modules (living through treatment, palliative care/end-of-life care, spirituality, and family) developed through this grant. Similarly, other research methodologies, such as the one described by Lienard [25] examining residents' verbal content and quantity of speech, could be highly illuminating. Additional research could also study the transfer of skills into actual clinical communication with real patients as well as their effect on clinical patient outcomes.

4.3. Practice implications

Implementation of this brief training module within medical schools, residency training, and/or continuing education programs could lead to improved communication skills, patient care, and quality of life.

Conflict of interest

The authors declare no conflicts of interest.

Informed consent and patient details

"I confirm all patient/personal identifiers have been removed or disguised so the patient/person(s) described are not identifiable and cannot be identified through the details of the story."

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