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Narrative medicine as a teaching strategy for nursing students to developing professionalism, empathy and humanistic caring ability: a randomized controlled trial

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Abstract

Background Narrative medicine has become a solution to cultivate medical students' ability of empathy and humanistic care. However, the role of narrative medicine is lacking in the study of professionalism. The aim of this study was to analyze the effects of narrative medical theory learning and narrative writing on professionalism, empathy and humanistic care ability of nursing students.

Methods This cluster randomized controlled trial was conducted between June 2021 and June 2022 in two universities in Jiangsu, China. The participants of this study were 85 nursing students who were randomly divided into the intervention group ($n = 43$) or the control group ($n = 42$). Participants in the intervention group were trained in narrative medical theory learning and narrative writing based on a Web-based platform, while those in the control group were not. Self-report questionnaires of professionalism, empathy and humanistic care ability were used before and after intervention.

Results The results showed that the professionalism score of the intervention group was (68.7 ± 6.8 vs. 64.5 ± 7.5 ; $P = 0.005$), empathy (99.4 ± 15.7 vs. 92.2 ± 14.6 ; $P = 0.014$) and humanistic care ability (127.6 ± 20.0 vs. 113.3 ± 18.8 ; $P = 0.004$) were better than the control group.

Conclusion The results of this quantitative study suggest that narrative medical theory education and narrative writing based on the network platform can promote the development of professionalism, empathy and humanistic care ability of nursing undergraduates.

Keywords Narrative medicine, Professionalism, Empathy, Humanistic care, Nursing students, Controlled trial

Background

This study was guided by the theory of narrative medicine, first proposed by Rita Charon in 2001 and defined as the ability to acknowledge, absorb, interpret, and act on the stories and plights of others [1]. It is based on a model of empathy, reflection, professionalism and trust, and is inseparable from the concepts of empathy, humanism and professionalism [1]. Narrative medicine currently plays an important role in interdisciplinary learning, including in medicine, education, and the humanities,

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inspiring self-reflection and empathy [2], and which fosters narrative competence through curriculum content such as storytelling, careful reading, reflective writing, sharing, and discussion. To help healthcare professionals truly understand patients from different perspectives and experience their inner feelings in future clinical practice, so as to improve the level of humanistic literacy [2]. An innovative model of narrative medicine education should include training in writing skills [3]. On the one hand, one can benefit from training in narrative medicine (e.g., empathy) [4]. On the other hand, narrative writing in the form of storytelling can develop writing skills for personal and professional development [3]. In addition, the narrative medicine program includes potential benefits such as friendly interaction between faculty and students, narrative medicine writing skills, and understanding of ethical challenges [4].

Narrative-based medical interventions have a positive impact on medical students; such interventions are designed to help students hone their listening and observational skills, can stimulate self-reflection and empathy, help students think about patients from a different perspective, and are meaningful tools for motivating medical students' professional and personal development [2]. At the same time, narrative medical education has been applied to the teacher population to provide a unique space for reflection on their growth [5]. In China, the implementation of narrative medicine education is often used as a course to help medical students improve their medical narrative skills, empathy, and humanistic care [6, 7]. In addition, narrative medicine education is often taught in reliance on a university course, such as Nursing Psychology, English course, and Surgical Nursing [8–10]. Through the combination of narrative medicine and university courses, the goal is to achieve simultaneous improvement of knowledge and skills, medical humanities and clinical empathy. Few studies have been conducted to implement narrative medicine education for nursing students during clinical practice. However, the period of clinical practice is an important time to develop nursing students' professionalism, empathy, and humanistic care [11–13]. Therefore, providing a rich knowledge of medical humanities at this stage, enhancing medical empathy and humanistic care education and training, developing attention, listening, absorbing, interpreting, and responding to stories, etc., is important for the growth and development of future students' careers.

During nursing education, educators are increasingly concerned about teaching professionalism [14]. Professionalism refers to the value orientation and standards of practicing nurse which reflects work attitude and concepts of nursing [15]. However, in the clinical environment, nursing students are faced with the high turnover

rate of nurses, negative doctor-patient relationship, frequent workplace violence and other situations [16, 17], leading to cognitive deviation of nursing profession [18], which is not conducive to the cultivation of their professionalism. It has been reported that professionalism level can affect nurses' job satisfaction and retention intention [19, 20]. In addition, De Santa et al. pointed out that clinical practice is the best way to cultivate and educate nursing students' professionalism [11]. Therefore, developing the level of professional spirit during clinical practice has a positive impact on nursing students to continue to engage in this profession and alleviate the shortage of nurses.

Empathy is a multidimensional concept that includes emotional, cognitive, moral, behavioral and relational dimensions [21]. In the context of patient care, empathy has been defined as a cognitive attribute involving an understanding of patients' experiences, concerns, and perspectives together with the ability to communicate this understanding and the intention to help [22], and is an important part of medical humanities education. Currently, there is a controversy about whether empathy decreases during the education of medical students. Hojat et al. showed that the level of empathy did not change during the first 2 years of medical education, however, at the end of the third year, medical students showed a significant decline in empathy and this decline persisted until graduation, notably, the weakening of empathy occurred when the course was directed towards patient activities [23]. In a longitudinal study, Julia Ward et al. found the greatest decline in empathy levels among those students with the most clinical exposure and those with healthcare work experience [12]. However, Roff et al. found that medical students' empathy did not decline over time [24]. There is growing evidence that improved empathy during clinical practice increases patient adherence to treatment and patient satisfaction and builds positive relationships between nurses and patients, leading to more effective treatment outcomes [25, 26]. On the other hand, high levels of empathy can reduce stress and burnout [27, 28] and improve the quality of professional life [29]. Research has shown that empathy can be taught and trained through education and reflection [30]. Therefore, enhancing the level of empathy in nursing students is an important part of nursing education.

Jean Watson believed that nursing humanistic care ability was the nurses' externalization of humanistic literacy into the clinical work and abilities to serve the patients consciously and creatively, and outlined 10 carative factors/caritas processes that include the development of humanistic-altruistic system of values, the development of helping-trusting human-caring relationship, the instillation and the enabling faith and hope, and the provision

for a supportive, protective, and/or corrective mental, social, spiritual environment [31]. Nurses with high humanistic care ability can help reduce patients' suffering related to disease, establish a good relationship with patients and their families, and better understand the meaning of their work [13]. Therefore, it is extremely important to cultivate nursing students to provide humanistic care behavior and caring ability for patients, and it is also the important responsibility and moral mission of teachers [32, 33].

As far as we know, there is a relative consensus on the efficacy of narrative medicine in cultivating empathy and humanistic care ability of medical students in both qualitative and quantitative studies, but the role of narrative medicine in professionalism in quantitative studies is lacking in the existing literature, which may be of significance to clinical practice and nursing education. In addition, our research focuses on bridging the gap in medical humanities education for undergraduate nursing students during their clinical practice period. We encourage students to combine theory and practice. With a strong theoretical foundation in narrative medicine, students can get a real sense of professionalism, empathy and humanistic care during their clinical placements with patients and healthcare professionals, and improve their own narrative writing skills. Therefore, this study designed a 12-month narrative medicine theory learning and narrative writing project to explore the application effect of narrative medicine in clinical practice on the professionalism, empathy ability and humanistic care ability of nursing students, as follows:

- (1) Does the narrative writing approach based on narrative medicine theory improve nursing students' level of professionalism, empathy, and humanistic care ability in clinical practice?
- (2) Are there differences in the level of development of professionalism, empathy, and humanistic care ability of nursing students in the clinical setting with narrative writing methods based on narrative medicine theory compared to traditional practice logs?

Methods

Study design and methods of rigor

This study was in accordance with CONSORT guidelines and was a cluster randomized controlled trial. This study was conducted from June 2021 to June 2022 at two institutions of higher learning in Jiangsu, China. Cluster randomized controlled trial is a trial design in which study subjects are randomly assigned in clusters, which is designed to prevent sample contamination and improve participant compliance [34]. Before the nursing students

entered clinical practice, the two schools held a meeting respectively, in which the same researcher explained the relevant information of the study to the nursing undergraduates in the form of face to face, and recruited nursing undergraduates who volunteered to participate in the study. At the end of the session, the participants all signed a written informed consent form. The cluster was defined as a school in this study and the random allocation of the intervention and control groups was carried out using a simple random grouping method (i.e. lottery). Two clusters are placed in two opaque envelopes and one envelope is randomly selected by one person, then that cluster is the intervention group and the other cluster is the control group.

Participants

G*Power 3.1 was used to calculate the minimum sample size for analyzing differences between the two groups by a two-tailed test. With a statistical significance level of 0.05, power of 0.80, and effect size of 0.65, the sample size was calculated to be 39 for each group, totaling 78. Participants were fourth-year nursing undergraduates entering clinical practice. Nursing students who were able to complete the one-year internship required by the university and nursing students who did not take courses related to narrative medicine were eligible to participate in this study. Considering potential dropouts, we ultimately recruited 85 nursing students from both institutions (intervention group=43, control group=42), and all participants provided written and verbal informed consent.

Procedure

Researchers used demographic questionnaires, the professionalism scale, the empathy scale, and the humanistic care ability scale to examine baseline levels in both groups. Students in both the intervention and control groups were required by both schools to keep a minimum of one internship journal for 2 weeks. On this basis, the intervention group substituted the writing of internship logs through narrative medical theory courses and narrative writing, while the control group did not. At the end of clinical practice, the test results of the professionalism scale, empathy scale, and humanistic care ability scale were first compared between the two groups before and after the intervention, and secondly, the test scores were compared within the group before and after the intervention to assess the effectiveness of the intervention. We approached and assessed 85 fourth-year nursing students to participate in the study, with three students in the experimental group and two in the control group unable to complete the final assessment, as shown in Fig. 1.

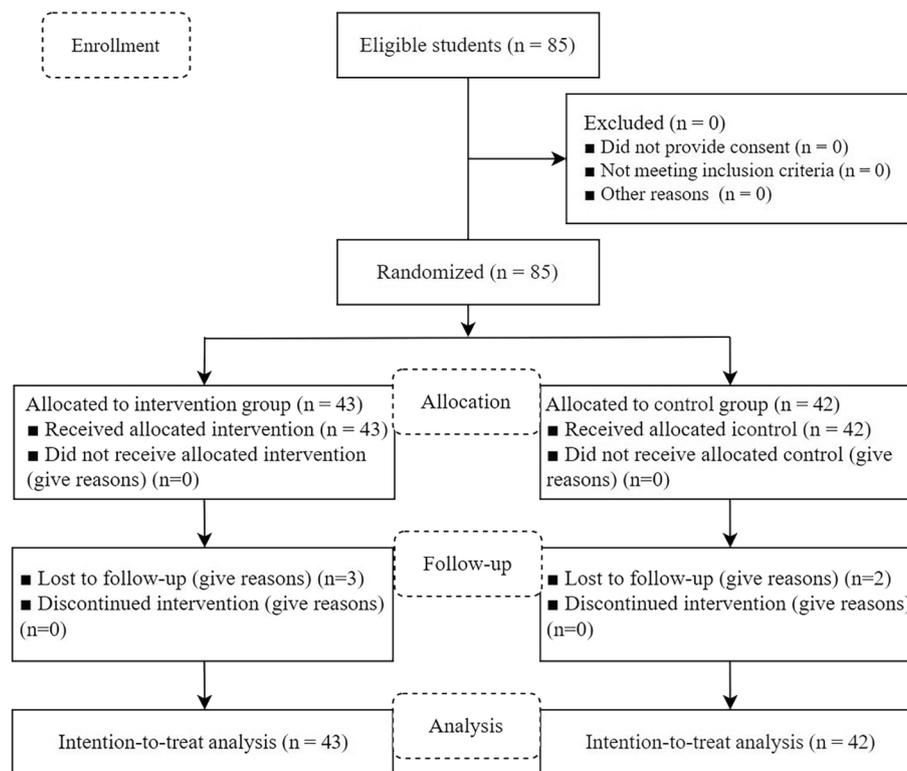


Fig. 1 Flowchart of the inclusion of study participants according to CONSORT diagram

Narrative medicine program

Narrative medicine was introduced to the undergraduate nursing residency program, which focuses on narrative medicine seminars and narrative writing. First, participants attend a 3.5-hour narrative medicine seminar that focuses on giving students a preliminary understanding of narrative medicine and narrative writing. Then, we encourage nursing students to use narrative writing methods based on narrative medicine theory to record the stories between interns and patients, interns and medical staff, and medical staff and patients during clinical practice, and evaluate and share their narrative works. The purpose of this process is to cultivate the professionalism, empathy and humanistic care ability of nursing students. The narrative medicine model consists of a series of activities, described as follows:

Activity 1 Narrative medicine seminar

During clinical practice, we conduct a narrative medicine seminar. The conference consists of three parts, with students first receiving a 2-hour lecture on the theoretical background and empathy of narrative medicine. Then, students will read the narrative works carefully for 45 minutes to help them have a deep understanding of the narrative works. Finally, the students received a

45 min course and introduced the narrative writing content, as shown in Table 1.

Activity 2 Narrative writing theme

First, a researcher trained in a systematic course in narrative medicine talks to students about writing criteria (e.g., descriptions of time, place, people, reflections, etc.) so that nursing students know what narrative writing entails. Second, the evaluator explains the writing topic to the students, as shown in Table 2. During the writing process, nursing students chose their own topics and detailed their observations and reflections on their clinical experiences in narrative writing. One narrative writing was completed every 2 weeks, and students submitted the content and related pictures to an online web platform to facilitate timely feedback from the evaluators.

Activity 3 Evaluation of narrative works

After the nursing students submit their narrative writing, researchers will evaluate and give feedback on their narrative writing every 2 weeks through the online platform according to the writing standards, so that the nursing students can receive feedback and correct their writing in time. For example, the narrative writing submitted by the nursing students did not adequately describe their inner feelings and did not reflect on their own behaviors.

Table 1 Course content of narrative medicine seminar

Theme	Goal	Content	Duration
Narrative medicine theory	Help students understand narrative medicine theory and lay the foundation for future narrative writing	(1) Definition and origin of narrative medicine. (2) Three focal points of narrative medicine. (3) Three elements of narrative medicine. (4) Two tools of narrative medicine.	1 h
Clinical empathy	Help students empathize with the patient's story through narrative	(1) Empathic ability. (2) Performance of empathic behavior. (3) How to improve empathy by means of narrative.	1 h
Close reading of narrative works	Develop students' narrative reading, observation, and listening skills.	(1) Reading of classic short stories and middle-length novels in narrative medicine. (2) Narrative work reading and empathy construction.	45 min
Narrative writing (reflective writing and parallel medical records)	Develop students' narrative writing skills and enhance their reflective skills.	(1) Watching videos adapted from real cases. (2) Reflective writing/parallel medical records. (3) Writing Content.	45 min

Table 2 Themes of narrative writing

Theme	Goal	Item
Patient and self	Help nursing students tell patients' stories and understand patients' feelings.	Please write down a patient experience that has impressed you Please write down a warm moment of interaction with your patient Please write down your understanding of the background of the patient's illness Please write down the moment of your emotional disclosure
Medical staff and patient	Help nursing students to feel the relationship between medical staff and patients as an observer	Please write down your most rewarding moment Please write down what you think is a good doctor-patient relationship Please write down the humanistic behaviors you see in the medical staff
Medical staff and self	To help nursing students enhance their professional understanding through contact with medical staff	Write down the qualities or behaviors of the people you admire most in the clinical staff Please write about your caring moments with the medical staff Please write about what you know about this medical career or what actions have influenced your view of the profession with a new perspective.

Researchers should guide the nursing students to think by asking questions, such as, "What was your first feeling when you knew the experience of the patient?". Unqualified narrative writing should be returned for revision, such as misinterpreting narrative writing as simply describing the events of the day or week. This activity aims to improve the quality of nursing interns' narrative writing, ensuring that students have descriptions, feelings and reflections in narrative writing.

Activity 4 Sharing of narrative works

The research team establishes a column of excellent narrative works, and two researchers select 2–5 narrative works and send them to the column every 2 weeks. If

there are some incomplete or sentence problems in the narrative works, researchers need to submit suggestions for modification to the nursing students, and the works will be pushed to the column after modification and improvement. Finally, researchers shared this column with nursing students. The purpose of this sharing activity is to promote nursing interns to better understand the patient experience and the reflective experience of other students, and to play a role of mutual learning.

Measures

The professionalism scale

Nursing professionalism was assessed using Chinese version of Hall's Professionalism Inventory. The inventory

was originally designed to determine suitable criteria and measure a person's professional standing by Professor Richard Hall in 1968 [35]. Wu translated and revised the scale into Chinese in 2019, which was proved to have good reliability and validity, and was applied to Nursing students in China [36]. The Chinese inventory consisted of six subscales including professional organization, public service, self-discipline, autonomy, sense of mission and job satisfaction and a total of 20 items. Every item is rated on a 5-point Likert-scale (1 = totally disagree to 5 = totally agree). Higher scores indicates higher level of nursing professionalism. The Cronbach's α coefficient was 0.750 and the test-retest reliability was 0.840 [36]. In this study, Cronbach's alpha was 0.729.

The Jefferson scale of empathy for nursing students (JSPE-NS)

We used a nursing student version of the Jefferson Scale of Empathy to assess nursing students' empathy. The scale, developed by Hojat et al. [37], is divided into three dimensions of perspective taking, compassionate care, and standing in patient's shoes, with 20 items. Every item is rated on a 7-point Likert-scale (1 = totally disagree to 7 = totally agree). Scores range from 20 to 140. The Cronbach's α coefficient and construct validity of the Chinese version of JSPE-NS are 0.74 and 0.89, respectively [38]. In this study, Cronbach's alpha was 0.868.

The humanistic caring ability of nursing undergraduates

The evaluation of students' humanistic care ability adopts the humanistic care ability scale of nursing students compiled by Huang Gebing. The scale is based on Watson's humanistic care theory and its 10 caring factors [39], which contains eight dimensions: Instilling faith and hope, health education, humane and altruistic values, scientifically solving health problems, helping to meet basic needs, providing a good environment, promoting emotional communication, helping to solve difficulties, a total of 45 items. The scale adopted likert 5-level score (0 = completely inconsistent to 4 = completely consistent), with scores ranging from 0 to 180. The higher the score, the better the humanistic care ability. The Cronbach's α coefficient and content validity of the scale were 0.904 and 0.960, with good reliability and validity [40]. It has been widely used in nursing students in China. In this study, Cronbach's alpha was 0.952.

Statistical analysis

The data were analyzed using IBM SPSS Version 26. Statistical analysis also uses intention-to-treat analysis (ITT) to process missing data [41]. The categorical variables were described using frequency and percentage, and the continuous variables were described using mean

(standard deviation). Pearson chi-square test was used to analyze the differences of categorical variables. If the variables were normally distributed, the difference between the two groups of continuous variables was tested using the independent sample T test; otherwise, the Mann-Whitney U nonparametric test was used. Paired T test or Wilcoxon rank sum test were used to analyze the differences between the two groups before and after intervention.

Results

Comparison of baseline characteristics

The mean age of the 85 participants was 21.5 ± 1.2 years, of which 13 (15.3%) were male and 72 (84.7%) were female. There were no significant differences between the intervention group and the control group in age, gender, family background, only child, student cadre and internship team leader ($P > 0.05$). In addition, there were no significant differences between the two groups in the baseline scores of professionalism, empathy, and humanistic care ability before the intervention ($P > 0.05$), as shown in Table 3.

Comparison between the two groups after intervention

Compared with the nursing students in the control group, the professionalism (68.7 ± 6.8 vs. 64.5 ± 7.5 ; $P = 0.005$), empathy (99.4 ± 15.7 vs. 92.2 ± 14.6 ; $P = 0.014$) and humanistic care ability (127.6 ± 20.0 vs. 113.3 ± 18.8 ; $P = 0.004$) of the students in the intervention group were significantly improved, as shown in Table 4. Figure 2 shows the comparison of professionalism, empathy and humanistic care ability scores between the two groups before and after the intervention.

Intra-group comparison before and after intervention

We also analyzed the comparison of pre - and post-intervention scores between the intervention and control groups. Data showed that from baseline to intervention, scores of professionalism (63.8 ± 6.2 vs. 64.5 ± 7.5 ; $P = 0.431$), empathy (88.7 ± 11.9 vs. 92.2 ± 14.6 ; $P = 0.072$) and humanistic care ability (114.3 ± 20.6 vs. 113.3 ± 18.8 ; $P = 0.886$) in the control group showed no significant differences, while scores of professionalism (65.0 ± 7.8 vs. 68.7 ± 6.8 ; $P = 0.003$), empathy (89.6 ± 14.0 vs. 99.4 ± 15.7 ; $P = 0.001$) and humanistic care ability (117.5 ± 22.3 vs. 127.6 ± 20.0 ; $P = 0.025$) in the intervention group were significantly improved, as shown in Table 5.

Discussion

The results of this study confirm that after 12 months of intervention, participants assigned to the narrative medicine program showed more favorable changes in

Table 3 Comparison of baseline characteristics between the control group and the intervention group

Variables	Control group (n = 42)	Intervention group (n = 43)	χ^2/Z	P value ^a
Age, mean (SD)	21.4 (0.9)	21.5 (1.4)	-0.724	0.469
Gender, N (%)				
Males	7 (16.7)	6 (14.0)	0.121	0.728
Females	35 (83.3)	37 (86.0)		
Family background, N (%)				
Urban	21 (50.0)	20 (46.5)	0.104	0.784
Rural	21 (50.0)	23 (53.5)		
Only child, N (%)				
Yes	21 (50.0)	25 (58.1)	0.567	0.451
No	21 (50.0)	18 (41.9)		
Student cadre, N (%)				
Yes	19 (45.2)	28 (65.1)	3.396	0.065
No	23 (54.8)	15 (34.9)		
Internship team leader, N (%)				
Yes	7 (16.7)	9 (20.9)	0.253	0.615
No	35 (83.3)	34 (79.1)		
Professionalism, mean (SD)	63.8 (6.2)	65.0 (7.8)	-0.337	0.736
Empathy, mean (SD)	88.7 (11.9)	89.6 (14.0)	-0.373	0.709
Humanistic care ability, mean (SD)	114.3 (20.6)	117.5 (22.3)	-0.503	0.615

^a Mann-Whitney U test results for continuous variables with abnormal distribution, and Chi-square test results for categorical variables

Table 4 Outcomes of 85 nursing students between intervention and control group, mean (SD)

Variables	Control group (n = 42)	Intervention group (n = 43)	Z	P value ^a
Professionalism	64.5 (7.5)	68.7 (6.8)	-2.816	0.005
Empathy	92.2 (14.6)	99.4 (15.7)	-2.455	0.014
Humanistic care ability	113.3 (18.8)	127.6 (20.0)	-2.844	0.004

^a Mann-Whitney U test

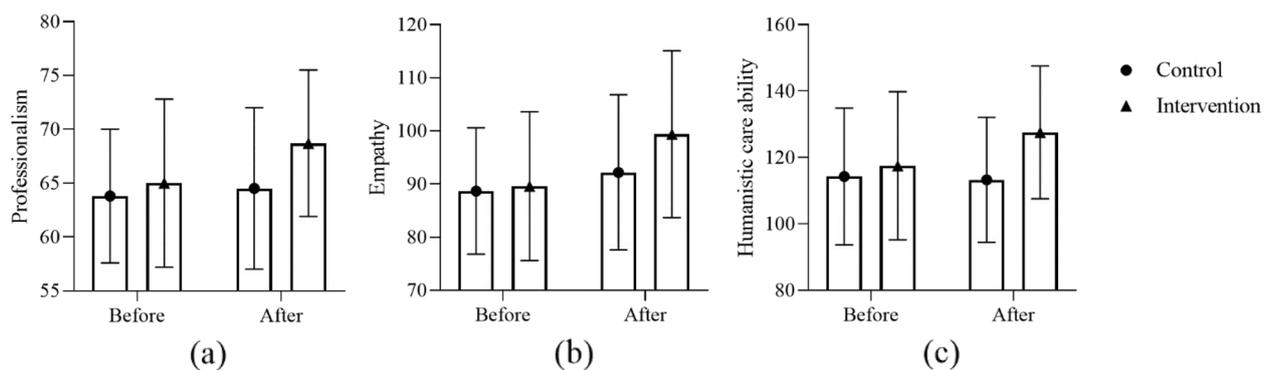


Fig. 2 The scores of professionalism, empathy and humanistic care of nursing students before and after intervention were compared between the two groups

Table 5 Baseline and follow-up scores for the intervention and control groups, mean (SD)

Group	Variables	Pre-test	Post-test	t/Z	P value
Control	Professionalism	63.8 (6.2)	64.5 (7.5)	-0.795	0.431 ^a
	Empathy	88.7 (11.9)	92.2 (14.6)	-1.8	0.072 ^b
	Humanistic care ability	114.3 (20.6)	113.3 (18.8)	-0.143	0.886 ^b
Intervention	Professionalism	65.0 (7.8)	68.7 (6.8)	-3.135	0.003 ^a
	Empathy	89.6 (14.0)	99.4 (15.7)	-3.236	0.001 ^b
	Humanistic care ability	117.5 (22.3)	127.6 (20.0)	-2.326	0.025 ^a

^a T test; ^b Wilcoxon test

self-reported levels of professionalism than the control group. In addition, pre-test and post-test results in the intervention group showed better results in terms of professionalism. Therefore, the results of this study confirm that narrative medical theory education and narrative writing play a good role in the training of professionalism in nursing students. Previous qualitative research has suggested that narrative medicine has been found to positively influence the development of professional identity and professional literacy [42, 43]. Narrative-based medical education promote medical interns' perceptions of self-exploration, reflection, and awareness of professional identity, thereby influencing their learning of professionalism in clinical settings [42]. During the narrative writing process, participants in the intervention group observe or describe their interactions with patients and the behaviors of clinical healthcare professionals from a reflective perspective, thus sharing the new knowledge and skills they have learned, as well as their perceptions and outlook on values, sense of mission, and professional identity [42, 44]. Participants in the control group, on the other hand, would not, and they often stood to describe changes in their own professional skills more from their own perspective. In addition, the role of a role model or mentor influences the development of students' professionalism [45]. We set up writing themes to inspire students to look closely at the role model behaviors of health care professionals or mentors in clinical practice and write about them through narrative medicine. The content of these writings provokes students to reflect on their career paths, such as their responsible attitude towards patients and their work, and their passion for nursing. Therefore, reflective practice through writing is necessary for the development of students' professionalism.

In our study, after the intervention, the empathic ability of the intervention group was better than that of the control group. Also, the pre-test and post-test results of the intervention group showed a significant improvement in empathic ability. Therefore, students who received the narrative medicine education program showed more empathy than students who did not receive the program,

and the results were consistent with previous research [4, 46]. On the one hand, narrative theory educational learning can promote student empathy [4]. This may promote positive empathy among clinical staff by exploring literature [47]. Previous studies have shown [9, 48] that medical professionals' participation in narrative medicine programs leads to increased self-reported empathy scores. The three elements of narrative medicine are attention, reproduction, and belonging. By focusing on the patient, writing the patient's story, and in the process being able to feel what the patient feels and understand the patient's perspective; attention and reproduction spiral into a belonging relationship between the doctor and the patient, nursing interns are able to examine their own behavior and thoughts in this process, understand the patient, and empathize with them [9]. On the other hand, writing may be an important way to enhance empathy and by recording the patient's story, students have more perspective to contact the patient's emotions and gain a deeper understanding and appreciation of the patient as a way to achieve empathy [49]. However, one study reported only a small increase in participants' empathy levels 1 year after the narrative medicine workshop [2]. Therefore, future research on how to maintain a steady increase in empathy levels through continuous training is essential.

The results of the study showed that after 12 months of narrative medicine education, the humanistic care competencies of the intervention group were significantly higher than those of the control group. At the same time, the pre-test and post-test results of the intervention group were significantly higher in humanistic care competence, which is consistent with previous studies [50]. Therefore, narrative medical theory education and narrative writing models help to improve students' humanistic care, which may be due to a variety of reasons. Jeffrey Lorenz pointed out that the cultivation of humanism has two key elements of medicine, one by building relationships with patients and the other by setting aside time for reflection through narrative creation, however, this is not present in most clinical rotations

[51]. In our study, we aim to encourage students to record their stories with patients and healthcare professionals and to create narratives in which they can feel and reflect in order to improve their personal humanistic care. Rita Mustika et al. believe that role models play an important role in the cultivation of humanism [52]. Students actively observe the humanistic behaviors of clinical medical staff, actively explore the effects and values of these behaviors through description and reflection, and eventually become their new behaviors. This helps to develop students' humanistic values and behaviors. In addition, studies have shown that nursing students' perception of organizational caring atmosphere can directly affect their humanistic care ability [53]. It is not only the caring behavior of clinical medical staff for patients and their families, but also the caring behavior of medical staff for interns and colleagues. By setting the theme of writing, we guide nursing students to pay attention to caring behaviors around them, which may make it easier for them to practice humanistic behaviors, so as to realize humanistic care for patients.

Therefore, this study used a combination of medical narrative theory training and narrative writing to develop students' narrative writing and reflection skills in order to enhance professionalism, empathy, and humanistic care among undergraduate nursing students. After a 12-month intervention study, the importance of narrative medicine in medical education in developing students' professionalism, empathy and humanistic care, especially in clinical practice, was confirmed.

Study limitations

This study is based on the writing requirements of the original internship diary into a narrative writing method based on narrative medicine theory. As far as we know, most schools in China require interns to submit internship logs, which may be beneficial to our narrative medicine intervention project. But the study also has the following limitations. First, our study used voluntary participation and self-report survey methods, which may be biased. Second, our study only investigated nursing undergraduates who participated in clinical practice, so we can further study nursing students of all grades in the future. Third, all nursing students are required to complete a two-week internship diary or narrative writing based on narrative medical theory as part of their fourth-year internship assignment, which may lead to bias. Fourth, this study lacks an assessment of the long-term impact of narrative medicine programs, which may have implications for the development of a longitudinal intervention program to maintain a steady increase in student professionalism, empathy, and humanistic care ability. Therefore, there is a need to evaluate the long-term

outcomes of narrative medical education and narrative writing programs in future studies.

Conclusion and practice implications

The results of this quantitative study demonstrate the benefits and value of a web-based platform for narrative medical theory education and narrative writing to promote the development of professionalism, empathy, and humanistic care ability in nursing students. This study used narrative medical theory training and writing themes to guide students in reflecting on a number of clinical performances and behaviors that lead to higher quality care for patients. Thus, narrative medicine, as an interdisciplinary field, can improve the humanistic component of medical education that is in short supply, which has the potential to benefit personal and professional development. Furthermore, in order to achieve the desired results, we must prioritize the enabling conditions that will benefit the development of narrative medicine projects. Narrative medical education is a novel teaching method that can be used to improve students' narrative writing and reflective skills through writing, and is a low-cost, easily shared learning tool. As far as we know, most institutions in China have a requirement to keep an internship journal, and these circumstances are more conducive to the development of narrative medical education. The intervention program in this study is easy to implement and replicable. These promote educational reform in clinical and nursing disciplines, bridge the gap in medical humanities education for nursing students during clinical practice, and provide some reference for the development of medical humanities literacy.

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Authors' contributions

Mengxin Xue conceived and designed the study, drafted the manuscript, designed the data collection tool and collected the data. Huiping Sun collected the data and edited the manuscript. Jin Xue organized the data collection. Jingxin Zhou, Junchao Qu, Siji Ji and Yuan Bu did the data collection. Yongbing Liu conceptualized and designed the study, coordinated and supervised data collection, and revised the content of the manuscript. All authors acknowledge the final draft submitted and agree to be responsible for all aspects of the work.

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Availability of data and materials

The datasets used and analyzed during the current study can be provided by the corresponding author on a reasonable request.

Declarations

Ethics approval and consent to participate

This study was reviewed and approved by the Ethics Committee of the College of Nursing, Yangzhou University (approval number: YZUHL2021028). It was registered in the Chinese Clinical Trial Registry on 09/04/2022 (Registration number: ChiCTR2200058472). All participants signed written informed consent before proceeding with any research activity. All methods were carried out in accordance with relevant guidelines and regulations.

Consent for publication

Not applicable.

Competing interests

The authors have no conflicts of interest relevant to this article to disclose.

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