Supplemental Digital Appendix 1

MEDLINE Search Strategy--At Least One Term From Each Column Required

	Professionalism	Postgraduate Medical Trainee	Educational Intervention
MeSH terms	Humanism Ethics, Medical Ethics Social Values Professional impairment Professionalism Professional Role Malpractice Professional Misconduct	Education, Medical, Graduate Internship and Residency	Curriculum Teaching Models, Educational
Keywords	Medical ethics Social values Professional impairment Professionalism Professional role Bioethics Humanism Humanist Malpractice Professional standard Professional misconduct	Graduate medical education Postgraduate medical education Internship Medic* adj intern* Residency Medic* adj residen* Fellowship House officer Houseofficer House staff Housestaff Registrar Foundation doctor	Curriculum Teaching Educational model Education program (Teach* OR Train* OR Educ*) adj3 (Exercise OR Intervention OR Program OR Technique OR Method OR Strategy OR Model)

1 (humanist or humanism).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
2 exp Humanism/
3 medical ethics.mp. or exp Ethics, Medical/
4 ethics/
5 social values.mp. or exp Social Values/
6 professional impairment.mp. or exp Professional Impairment/
7 professionalism.mp. or exp Professionalism/
8 professional role.mp. or exp Professional Role/
9 ((behav* or act or acts or action* or values) adj3 (ethic* or professional or professionally)).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
10 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9
11 exp Education, Medical, Graduate/ or postgraduate medical education.mp. or exp "Internship and Residency"/
12 (internship or residency or fellowship or "house officer" or houseofficer or "house staff" or housestaff or registrar or "foundation doctor").mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
13 graduate medical education.mp.
14 11 or 12 or 13
15 curriculum.mp. or exp Curriculum/
16 program development.mp. or exp Program Development/
17 program evaluation.mp. or exp Program Evaluation/
18 exp Teaching/ or teaching.mp.
19 educational models.mp. or exp Models, Educational/
20 competency-based education.mp. or exp Competency-Based Education/
21 15 or 16 or 17 or 18 or 19 or 20

Supplemental Digital Appendix 2

Embase Search Strategy—At Least One Term From Each Column Required

	Professionalism	Postgraduate Medical Education	Educational Interventions
Emtree Terms	Professionalism Malpractice Medical ethics Humanism Bioethics	Resident Residency education Postgraduate education Surgical training	Education program Educational model Curriculum Curriculum development Teaching Teaching round
Key words	Professionalism Malpractice Professional standard Professional role Professional misconduct Bioethics Humanism Humanist Medical ethics Social values Professional impairment	Resident Residency education Postgraduate education Surgical training Fellowship House officer OR houseofficer House staff OR housestaff Registrar Foundation doctor medic* adj intern* medic* adj residen*	Educational program Educational model Curriculum Curriculum development Teaching (Teach* OR Train* OR Educ*) adj3 (Exercise OR Intervention OR Program OR Technique OR Method OR Strategy OR Model)

1 humanism.mp. or exp humanism/
2 humanist.mp.
3 medical ethics.mp. or exp medical ethics/
4 exp ethics/ or ethics.mp.
5 bioethics.mp. or exp bioethics/
6 morality.mp. or exp morality/

7 professionalism.mp. or exp professionalism/
8 professional role.mp.
9 ((behav* or act or acts or action or values) adj3 (ethic* or professional*)).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
10 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9
11 postgraduate education.mp. or exp postgraduate education/
12 exp residency education/ or residency.mp.
13 exp surgical training/ or surgical training.mp.
14 (internship or fellowship or "house officer" or houseofficer or "house staff" or housestaff or registrar or "foundation doctor").mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
15 11 or 12 or 13 or 14
16 exp education program/ or educational program.mp.
17 educational model.mp. or exp educational model/
18 exp curriculum/ or curriculum.mp.
19 curriculum development.mp. or exp curriculum development/
20 teaching.mp. or exp teaching/
21 16 or 17 or 18 or 19 or 20
22 10 and 15 and 21

Supplemental Digital Appendix 3

Characteristics of 50 Studies Included in a Systematic Review of Professionalism Curricula in Postgraduate Medical Education, Published 1980–September 2017

Study	Study population	Study design	Curriculum design	Professionalism topics addressed	Primary outcome (effect size and *P* value where available)[a]	Quality assessment (MERSQI)[b]
Adams et al, 2006[18]	**N**: 16 **Specialty**: OB **Level of Training**: PGY 1-5	RCT	**Modality**: Small group discussion (Balint group) **Frequency/Duration**: Every other week/ 6 months	Appropriate professional values and behavior; Self-awareness and personal well-being	**Behavior—** Musick 360° Evaluation-Intervention group improved more than control, but difference between groups NS	14
Alfandre and Rhode, 2009[19]	**N**: 68 **Specialty**: Multispecialty (NR) **Level of Training**: NR	Single group, posttest only	**Modality**: Other: Bioethics consultation **Frequency/Duration**: 1 session	Ethics in practice	**Self-report—** Developed a framework for "addressing future ethical problems with patient care"	6
Al-Jalahma and Fakhroo, 2004[20]	**N**: 36 **Specialty**: FM **Level of Training**: NR	Single group, pre- and posttest	**Modality**: Case-based discussion; simulation **Frequency/Duration**: 5 sessions/ 1 year	Ethics in practice	**Behavior—** Faculty observed improved ability to manage ethical cases	9.5
Arnold et al, 1988[21]	**N**: NR **Specialty**: IM **Level of Training**: PGY 1-3	Single group, posttest only	**Modality**: Case-based discussion **Frequency/Duration**: 12 sessions/ 3 years	Appropriate professional values and behavior; Accountability	**Self-report—** Improved ability to manage ethical cases	4

Study	Study population	Study design	Curriculum design	Professionalism topics addressed	Primary outcome (effect size and *P* value where available)[a]	Quality assessment (MERSQI)[b]
Arora, 2014[22]	**N**: 46 **Specialty**: OB **Level of Training**: NR	Single group, pre- and posttest	**Modality**: Didactics; case-based discussion **Frequency/Duration**: 10 sessions/ 1 year	Ethics in practice; Adhere to professional/ethical codes	**Knowledge—** 52% answered all knowledge questions correctly on posttest (vs. 10% on pretest; no p value)	10.5
Bagatell et al, 2002[23]	**N**: 10 **Specialty**: Pediatrics **Level of Training**: PGY 2-3	Single group, pre- and posttest	**Modality**: Case-based discussion; reflective exercise **Frequency/Duration**: 6 sessions	Manage personal and professional demands ; Self-awareness and personal well-being; Appropriate professional values and behavior (End of life and cultural competency)	**Self-report— Improved ability to cope with their own responses to a child's death and discussing death with families from a variety of ethnic/cultural backgrounds (comfort score improved by 1.38 points/5, 28%, *P* < .05)**	8.5
Ballon and Skinner, 2008[24]	**N**: 28 **Specialty**: Psychiatry **Level of Training**: PGY 1	Single group, posttest only (qualitative)	**Modality**: Reflective exercise; role modeling/mentorship; other (addiction psychiatry rotation) **Frequency/Duration**: 1-month rotation	Appropriate professional values and behavior; Self-awareness and personal well-being	**Self-report—** Improved ability to care for patients with addictions	NA

Study	Study population	Study design	Curriculum design	Professionalism topics addressed	Primary outcome (effect size and *P* value where available)[a]	Quality assessment (MERSQI)[b]
Berman and Villarreal, 1983[25]	**N**: 46 **Specialty**: Pediatrics **Level of Training**: PGY 1	Single group, posttest only	**Modality**: Case-based discussion **Frequency/Duration**: 1 full day	Self-awareness and personal well-being (End of life)	**Self-report—** Learned how to function effectively after a patient death and cope with feelings of inadequacy	7
Bethune and Brown, 2007[26]	**N**: 57 **Specialty**: FM **Level of Training**: PGY 1-3	Single group, posttest only (qualitative)	**Modality**: Reflective exercise **Frequency/Duration**: 10 written reflections/2 years	Appropriate professional values and behavior; Self-awareness and personal well-being	**Self-report—** Enhanced professional identity formation	NA
Brinkman et al, 2007[27]	**N**: 36 **Specialty**: Pediatrics **Level of Training**: PGY 1	RCT	**Modality**: Reflective exercise (self-assessment, multi-source feedback); mentorship **Frequency/Duration**: 1 coaching session	Appropriate professional values and behavior	**Patient outcome—** Improved patient satisfaction ratings (significant increase in friendliness, respect; overall improvement NS)	16
Brunton and Radecki,. 1992[28]	**N**: 30 **Specialty**: FM **Level of Training**: PGY 1	Single group, pre- and posttest	**Modality**: Simulation (simulate being a hospitalized patient) **Frequency/Duration**: 1 full day	Appropriate professional values and behavior	**Self-report—** 100% agreed that the simulation helped them be better physicians	7.5
Cataldo et al, 2005[29]	**N**: 182 **Specialty**: FM	Nonrandomized, 2 group	**Modality**: Small group discussion	Appropriate professional values	**Self-report—** JSPE: NS difference in	9.5

Study	Study population	Study design	Curriculum design	Professionalism topics addressed	Primary outcome (effect size and *P* value where available)[a]	Quality assessment (MERSQI)[b]
	Level of Training: NR	(control—historical	(Balint group) **Frequency/Duration**: weekly/ 3 years	and behavior	empathy scores between control and intervention group	
Chun et al, 2012[30]	**N**: 26 **Specialty**: Surgery **Level of Training**: PGY 1	Single group, pre- and posttest	**Modality**: Didactics; reflective exercise; simulation (OSCE) **Frequency/Duration**: 2 sessions	Appropriate professional values and behavior (cultural competency)	**Behavior—** NS improvement on faculty and standardized patients' evaluations of resident performance	12.5
Downar et al, 2012[31]	**N**: 44 **Specialty**: IM (critical care) **Level of Training**: PGY 4-5	Single group, pre- and posttest	**Modality**: Didactics; simulation **Frequency/Duration**: 1 half-day	Ethics in practice; Adhere to professional/ethical codes	**Knowledge— Improved ethical and legal knowledge (19% increase, *P* < .001)**	11
Dugan et al, 2014[32]	**N**: 22 **Specialty**: Surgery **Level of Training**: PGY 1-5	Single group, pre- and posttest	**Modality**: Case-based discussion; role modeling/mentorship **Frequency/Duration**: Full day workshop	Self-awareness and personal well-being	**Patient outcome—** PGSS: 8% increase in patient satisfaction scores over 9 years (statistical significance NR)	11.5
Farnan et al, 2013[33]	**N**: 288 **Specialty**: IM **Level of Training**: NR	Single group, posttest only	**Modality**: Case-based discussion **Frequency/Duration**: 1 session	Appropriate professional values and behavior; Respond to	**Self-report—** 67.2% intend to change their current practices	9

Study	Study population	Study design	Curriculum design	Professionalism topics addressed	Primary outcome (effect size and *P* value where available)[a]	Quality assessment (MERSQI)[b]
				unprofessional behavior		
Fleischman, 1981[34]	**N**: NR **Specialty**: Pediatrics **Level of Training**: NR	Single group, posttest only (qualitative)	**Modality**: Case-based discussion **Frequency/Duration**: Twice a month/ 15 months	Ethics in practice; Adhere to professional/ethical codes	**Self-report—** Increased understanding of ethics principles and ethical analysis; No change in ethical and moral views	NA
Foshee et al, 2017[35]	**N**: 49 **Specialty**: IM **Level of Training**: PGY 1-3	Single group, posttest only (qualitative)	**Modality**: Reflective exercise; online curriculum **Frequency/Duration**: 4 sessions	Self-awareness and personal well-being	**Self-report—** Assessment of personal reflections revealed more empathy, better able to reflect and make meaning from work	NA
Hochberg et al, 2016[36]	**N**: 31 **Specialty**: Surgery **Level of Training**: PGY 1-5	Nonrandomized, 2 group (control—historical)	**Modality**: Case-based discussion; didactics **Frequency/Duration**: 6 sessions	Appropriate professional values and behavior; Commitment to excellence; Ethics in practice; Respond to unprofessional behavior; Support colleagues in need	**Behavior—** **Professionalism items "well done" on OSCE more often in intervention group compared to control (59% vs. 38%; *P* < .001)**	13

Study	Study population	Study design	Curriculum design	Professionalism topics addressed	Primary outcome (effect size and *P* value where available)[a]	Quality assessment (MERSQI)[b]
Hogan et al, 2011[37]	**N**: 173 **Specialty**: EM **Level of Training**: NR	Single group, pre- and posttest	**Modality**: Didactics **Frequency/Duration**: 1 session	Appropriate professional values and behavior	**Self-report—Increased compassion toward seniors (Score improved by 0.32 points/5, 6%, *P* = .012)**	10
Joyner and Vemulakonda, 2007[38]	**N**: 16 **Specialty**: Surgery (Urology) **Level of Training**: NR	Single group, pre- and posttest	**Modality**: Didactics **Frequency/Duration**: 1 session	Appropriate professional values and behavior; Ethics in practice	**Behavior—Improved professionalism score on resident global performance evaluation (4-6% improvement, *P* < .01)**	12.5
Khandelwal et al, 2015[39]	**N**: 52 **Specialty**: Multispecialty **Level of Training**: NR	Single group, pre- and posttest	**Modality**: Self-study (pre course); simulation **Frequency/Duration**: 4 hour workshop	Appropriate professional values and behavior; Technology; Respond to unprofessional behavior; Self-awareness and personal well-being	**Self-report—Increased comfort in defining and applying tenets of professionalism (*P* < .05)**	8
Khanum. 2013[40]	**N**: 24 **Specialty**: OB **Level of Training**:	Single group, pre- and posttest	**Modality**: Reflective exercise; didactics **Frequency/Duration**: 1 didactic and 4	Appropriate professional values and behavior; Accountability	**Knowledge—** Ability to reflect on professionalism in written reflections	11

Study	Study population	Study design	Curriculum design	Professionalism topics addressed	Primary outcome (effect size and *P* value where available)[a]	Quality assessment (MERSQI)[b]
	PGY 1-5		written exercises/ 1 year		improved over time (NS)	
Krajewski et al, 2008[41]	**N**: 43 **Specialty**: Surgery **Level of Training**: NR	Single group, pre- and posttest	**Modality**: Didactics **Frequency/Duration**: 2 sessions	Appropriate professional values and behavior (cultural competency)	**Knowledge—Improved cultural competence knowledge (40% increase, *P* < .001)**	12
Kumar et al, 2007[42]	**N**: 47 **Specialty**: Surgery **Level of Training**: PGY1-5	Nonrandomized, 2 group (control—no intervention)	**Modality**: Self-study (ACS Professionalism DVD) **Frequency/Duration**: 1 session	Appropriate professional values and behavior; Conflict of interest; Accountability; Patient safety/ quality improvement; Self-awareness and personal well-being	**Knowledge—** Improved "professionalism knowledge" score (*P* = .09)	13.5
Kung et al, 2015[43]	**N**: 30 **Specialty**: Radiology **Level of Training**: PGY 2-5	Single group, pre- and posttest	**Modality**: Case-based discussion; reflective exercise **Frequency/Duration**: 6 sessions/ 1 year	Appropriate professional values and behavior; Technology; Respond to unprofessional behavior; Self-awareness and	**Self-report—** PSCMPQ: NS change in attitudes overall (improvement in some areas, *P* ≤ .042 for 7 out of 36 questions)	9.5

Study	Study population	Study design	Curriculum design	Professionalism topics addressed	Primary outcome (effect size and *P* value where available)[a]	Quality assessment (MERSQI)[b]
				personal well-being; Support colleagues in need		
Kwakye et al, 2015[44]	**N**: 13 **Specialty**: Surgery **Level of Training**: PGY 4-5	Single group, posttest only	**Modality**: Role modeling/ mentorship ("Apprenticeship rotation") **Frequency/Duration**: 4-week rotation	Appropriate professional values and behavior; Commitment to excellence; Accountability; Adhere to professional/ethical codes; Self-awareness and personal well-being; Manage personal and professional demands	**Behavior—** All faculty reported improvements in professionalism skills	8.5
Larkin et al, 2010[45]	**N**: 42 **Specialty**: Surgery **Level of Training**: PGY 1-3	Single group, pre- and posttest	**Modality**: Case-based discussion; simulation **Frequency/Duration**: 9 workshops/ 2 years	Appropriate professional values and behavior; Self-awareness and personal well-being; Manage personal and professional demands	**Self-report—** PSS: *Worsened* stress levels ($P = .009$)	10.5

Study	Study population	Study design	Curriculum design	Professionalism topics addressed	Primary outcome (effect size and *P* value where available)[a]	Quality assessment (MERSQI)[b]
Levine and Bryson. 2008[46]	**N**: 32 **Specialty**: IM **Level of Training**: PGY 1	Single group, posttest only (qualitative)	**Modality**: Reflective exercise **Frequency/Duration**: Every other month/ 1 year	Self-awareness and personal well-being	**Self-report—** 83% reported the curriculum had a positive effect on their professionalism skills	NA
McCue and Sachs. 1991[47]	**N**: 64 **Specialty**: IM, Pediatrics **Level of Training**: PGY 1-5	Nonrandomized, 2 group (control—no intervention)	**Modality**: Case-based discussion **Frequency/ Duration**: 1 Half-day	Self-awareness and personal well-being	**Self-report—** **ESSI: Improved ability to manage stress compared to control (*P* < .001)**	10
Packer. 2005[48]	**N**: 55 **Specialty**: Surgery (Ophthal-mology) **Level of Training**: PGY 1-5	Single group, pre- and posttest	**Modality**: Didactics **Frequency/Duration**: 1 vs. 3 vs. 10 lectures/ 1 year	Ethics in practice; Conflict of interest; Technology; Accountability	**Behavior—** NS improvement on faculty evaluation of resident performance	11.5
Parikh et al, 2008[49]	**N**: 65 **Specialty**: Surgery **Level of Training**: NR	Nonrandomized, 2 group (control—historical)	**Modality**: Didactics; self-study; other (M-M rounds) **Frequency/Duration**: Weekly/1 year	Appropriate professional values and behavior; Ethics in practice	**Self-report**— **More able to apply professional/ethical principles (17% increase, *P* = .004); More able to respond**	10

Study	Study population	Study design	Curriculum design	Professionalism topics addressed	Primary outcome (effect size and *P* value where available)[a]	Quality assessment (MERSQI)[b]
					sensitively to patients (28% increase, *P* < .001)	
Schiffman et al, 2008[50]	**N**: 57 **Specialty**: Pediatrics **Level of Training**: PGY 1-3	Single group, pre- and posttest	**Modality**: Small group discussion; role modeling/mentorship **Frequency/Duration**: 6 sessions	Appropriate professional values and behavior; Self-awareness and personal well-being (palliative care)	**Self-report— Increased ability to manage patient anxiety about death (*P* < .05);** Increased awareness of varied religious and cultural beliefs (NS)	8.5
Schuh and Burdette. 2004[51]	**N**: 12 **Specialty**: Neurology **Level of Training**: PGY 1-3	Single group, pre- and posttest	**Modality**: Case-based discussion **Frequency/Duration**: Weekly/ 10 weeks	Ethics in practice; Conflict of interest; Adhere to professional/ethical codes	**Knowledge— 19.2% improvement on ethics knowledge test (*P* < .0004)**	12
Seaberg et al, 2000[52]	**N**: 25 **Specialty**: EM **Level of Training**: PGY 1	Single group, posttest only	**Modality**: Simulation (simulate being a patient admitted to ED) **Frequency/Duration**: One full day	Appropriate professional values and behavior	**Self-report—** More able to empathize with patients	6
Sekeres et al, 2003[53]	**N**: 29 **Specialty**: IM (Hematology-	Single group, pre- and posttest	**Modality**: Small group discussion (Balint group)	Appropriate professional values and behavior;	**Self-report— Improvement in view of self as a physician**	12.5

Study	Study population	Study design	Curriculum design	Professionalism topics addressed	Primary outcome (effect size and *P* value where available)[a]	Quality assessment (MERSQI)[b]
	oncology) **Level of Training**: PGY 5		**Frequency/Duration**: Every 2 weeks/ 6 months	Self-awareness and personal well-being; Manage personal and professional demands	**(mean increased from 3.8 to 4.1 /5, *P* = .01)** NS change in perceived stress levels or ability to deal with emotional situations	
Sim et al, 2015[54]	**N**: 387 **Specialty**: Psychiatry **Level of Training**: PGY 2-3	Single group, posttest only	**Modality**: Case-based discussion **Frequency/Duration**: 1 session	Ethics in practice	**Self-report—** 86.4% felt better equipped to handle biomedical research ethical dilemmas	6.5
Singer et al, 2009[55]	**N**: 27 **Specialty**: FM **Level of Training**: NR	Single group, pre- and posttest	**Modality**: Didactics; other (palliative care rotation) **Frequency/Duration**: 8-month rotation	Appropriate professional values and behavior; Self-awareness and personal well-being	**Self-report—** NS change in comfort with dying patients or emotional well-being	9.5
Slavin et al, 2017[56]	**N**: 35 **Specialty**: Pediatrics **Level of Training**: PGY 1	Nonrandomized, 2 group (control—historical)	**Modality**: Didactics; Small group/case-based discussion **Frequency/ Duration**: Monthly/ 10 months	Self-awareness and personal well-being; Manage personal and professional demands	**Self-report—** **MBI: Decreased burnout (29 vs. 78%, *P* < .01)** **CESD: Decreased depression (12 vs 50%, *P* < .05)** State-Trait Anxiety	11

Study	Study population	Study design	Curriculum design	Professionalism topics addressed	Primary outcome (effect size and *P* value where available)[a]	Quality assessment (MERSQI)[b]
					Inventory: NS change	
Smith et al, 1995[57]	**N**: 26 **Specialty**: IM, FM **Level of Training**: PGY 1	RCT	**Modality**: Didactics; case-based discussion (intensive psychosocial training) **Frequency/Duration**: 12 sessions/ 1 month	Appropriate professional values and behavior; Self-awareness and personal well-being	**Patient outcome—Patients were more confident and satisfied with residents in the intervention group (*P*= .01; *P* = .02)**	15
Srinivasan et al, 2011[58]	**N**: 279 **Specialty**: IM, Pediatrics, FM **Level of Training**: NR	Single group, pre- and posttest	**Modality**: Online curriculum/self-study **Frequency/Duration**: 5 online tutorials	Ethics in practice; Adhere to professional ethical codes	**Self-report—Self-confidence in ethics knowledge improved by 15% (*P* < .01)**	12.5
Sulmasy et al, 1993[59]	**N**: 85 **Specialty**: IM **Level of Training**: PGY 1-3	Nonrandomized, 2 group	**Modality**: Didactics; case-based discussion **Frequency/Duration**: 6 lectures vs. 6 lectures and 6 case conferences/ 6 months	Adhere to professional/ethical codes	**Knowledge—**NS differences in ethics knowledge test between groups	13.5
Sulmasy and Marx. 1997[60]	**N**: 42 **Specialty**: IM **Level of Training**: PGY 1-3	Single group, pre- and posttest	**Modality**: Didactics; case-based discussion **Frequency/Duration**: Every other month/ 2 years	Ethics in practice; Adhere to professional/ethical codes	**Knowledge—14% improvement in ethics knowledge test (*P* = .008)**	11.5
Thirunavukarasu et al, 2010[61]	**N**: 29 **Specialty**:	Single group, pre- and posttest	**Modality**: Didactics; case-based discussion	Appropriate professional values	**Knowledge—7% improvement on**	13

Study	Study population	Study design	Curriculum design	Professionalism topics addressed	Primary outcome (effect size and *P* value where available)[a]	Quality assessment (MERSQI)[b]
	Surgery **Level of Training**: PGY 2-3		(ACS *Ethical Issues in Clinical Surgery*) **Frequency/Duration**: 4 sessions/ 1 year	and behavior; Ethics in practice; Adhere to professional/ethical codes; Conflict of interest; Accountability	**ethics knowledge test (*P* = .013)**	
Tolchin et al, 2015[62]	**N**: 31 **Specialty**: Neurology **Level of Training**: PGY 2-5	Single group, pre- and posttest	**Modality**: Case-based discussion; Simulation **Frequency/Duration**: Monthly/ 1 year	Ethics in practice	**Knowledge—10.9% increase in ability to manage ethically complex cases (*P* = .02)**	12
Wada et al, 2013[63]	**N**: 28 **Specialty**: Psychiatry **Level of Training**: PGY 1	Single group, pre- and posttest	**Modality**: Didactics **Frequency/Duration**: 6-hour seminar	Ethics in practice; Adhere to professional/ethical codes	**Knowledge—Improved understanding of psychiatric ethics (*P* = .00)**	10
Wen et al, 2013[64]	**N**: 9 **Specialty**: EM **Level of Training**: PGY 1-3	Single group, posttest only	**Modality**: Case-based discussion; reflective exercise **Frequency/Duration**: Monthly/ 1 year	Ethics in practice; Self-awareness and personal well-being	**Self-report—** Improved well-being and emotional resilience	7

Study	Study population	Study design	Curriculum design	Professionalism topics addressed	Primary outcome (effect size and *P* value where available)[a]	Quality assessment (MERSQI)[b]
Wenger et al, 1998[65]	**N**: 62 **Specialty**: Surgery (Orthopedics) **Level of Training**: PGY 4-5	Nonrandomized, 2 group	**Modality**: Case-based discussion **Frequency/Duration**: Monthly/ 1 year	Appropriate professional values and behavior; Ethics in practice; Respond to unethical behavior; Support colleagues in need	**Knowledge—** **Improved score on "clinical ethics knowledge test" (81 vs. 74% correct, *P* = .002)**	12
Ziegler et al, 1984[66]	**N**: NR **Specialty**: IM **Level of Training**: PGY 1	Single group, posttest only	**Modality**: Small group discussion **Frequency/Duration**: Weekly/36 weeks	Self-awareness and personal well-being	**Self-report—** 55% said the intervention helped them in dealing with their stress	5
Zuniga et al, 2006[67]	**N**: 76 **Specialty**: Pediatrics **Level of Training**: PGY 1-3	Single group, posttest only	**Modality**: Didactics; case-based discussion; self-study; role modeling/mentorship; Other (community pediatrics curriculum) **Duration**: 3 years	Appropriate professional values and behavior (cultural competency)	**Behavior—** High professionalism score (mean score 4.74/5) on "community assessment of performance"	11.5

Abbreviations: ACS: American College of Surgeons; CESD: Center for Epidemiologic Studies Depression Scale; ED: Emergency department; EM: Emergency Medicine; FM: Family Medicine; IM: Internal Medicine; JSPE: Jefferson Scale of Physician Empathy; MERSQI: Medical Education Research Quality Instrument; MBI: Maslach Burnout Inventory; M-M: Morbidity and Mortality; NA: Not applicable; NR: Not reported; NS: Not significant; OB: Obstetrics and gynecology; PGSS: Press Ganey Patient Satisfaction Survey; PSCMPQ: Penn State College of Medicine Professionalism Questionnaire; PSS: Perceived Stress Scale; RCT: Randomized controlled trial;.

[a]A bolded outcome indicates that a statistically significant positive effect on the primary outcome was reported.

[b]The MERSQI is scored out of a possible 18, with higher scores indicating higher-quality studies.[16]

