Humanities in Predoctoral Dental Education: A Scoping Review

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Abstract: Health humanities usually includes such disciplines as philosophy, ethics, history, literature, performing arts, and cultural anthropology. The aims of this scoping review were, first, to search the published literature for references to the humanities in predoctoral dental education and, second, to determine if any research studies found that introducing humanities in dental education improved the overall profile of dental graduates. Literature searches were run in Ovid MEDLINE, Embase, ERIC, CINAHL, and Dentistry and Oral Sciences Source. A total of 248 articles were included in the review, with inclusion criteria comprising the areas of the curriculum, the scope of humanities, and predoctoral dental education. Of those articles, 101 referred in a targeted way to ethics in predoctoral dental education, while others mainly referred to the humanities in general or pointed out the role and place of humanities topics in predoctoral dental curricula. Topics covered included professional ethics, music, narrative learning, theater, art, communication skills, empathy, emotional intelligence, and cultural competence in the context of general humanistic education. The review found limited evidence of a clear impact, either short-term or long-term, of humanities education in predoctoral dental education. Reflections on humanistic education in the practice of clinical dentistry were sparse, as mainly documented by development of the ideal dentist-patient relationship, enhancement of empathy for patients, and most importantly, construction of professional moral values.

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We believe there is a need to develop a more humanistic model of education by integrating the study of humanities into predoctoral dental curricula. Although we have observed that a few dental schools have implemented humanities in their dental education, we also believe there is an overall acceptance that humanities may contribute decisively to the increase of dental students' professionalism, as reflected in the development of holistically oriented dental professionals and not merely technically qualified health care providers. The humanities include such disciplines as philosophy, ethics, history, literature, and the performing arts.[1] Brody defined medical humanities or health humanities as "a combination of its relevant disciplines—ethics and philosophy, religious studies, history, literature, and so forth."[2] Defining humanities in health professions education may be challenging; still, Hunt recognized it "as a means to emphasize, celebrate, and critically explore the human aspect of medicine."[3]

According to the Commission on Dental Accreditation (CODA) standards for dental education, a humanistic environment "inculcates respect, tolerance, understanding, and concern for others and is fostered by mentoring, advising, and small group interaction."[4] Due to the recognition that the concept of a profession has strong cultural components[5] and since "culture is the collective mutually shaping patterns of norms, values, assumptions, beliefs, standards, and attitudes that guide the behavior of individuals and groups, whether those groups be families, religions, races, geographic regions, nations, businesses, or professions,"[6] we believe the introduction of humanities into predoctoral dental curricula is a necessity for the academic dental community. The development of aspiring and holistically trained future dental professionals rests on the

belief that "education is a reflective experience that can lead to behavioral change."[7] On the other hand, we have heard the opinion that while the advent of technological interventions is beneficial, technology may become a barrier to interchange between dentists and patients if dental professionals treat patients as "cases" of oral diseases rather than individuals whose oral health is compromised.

The aims of this scoping review were, first, to search the published literature for references to the humanities in predoctoral dental education and, second, to determine if any research studies found that introducing humanities in dental education improved the overall profile of dental graduates. A scoping review is used to address broad areas of studies in which various research designs have been used in order to survey the extent of publications on the topic or identify research gaps in the literature, as implemented in previous scoping reviews.[8,9]

Methods

We systematically searched the literature for publications relating to humanities in predoctoral dental education. The search was performed by one of the authors (M.M.) who has experience developing systematic review searches. The search was initially run in December 2016 and rerun in July 2017 in Ovid MEDLINE, Ovid MEDLINE In-Process & Other Non-Indexed Citations, Ovid MEDLINE Epub Ahead of Print, Embase.com, ERIC via FirstSearch, and Dentistry and Oral Sciences Source via EBSCOhost. Non-English studies were excluded from the results. Each search consisted of a set of humanities terms crossed with a set of dental education terms. Controlled vocabularies, such as Medical Subject Headings, were used whenever possible and always complemented with title or abstract keywords (Table 1). Reference lists of studies were also checked.

Table 1. Keywords used for each database

Ovid MEDLINE, Ovid MEDLINE In-Process & Other Non-Indexed Citations, Ovid MEDLINE Epub Ahead of Print

Copy and pastable: (exp humanities/ed and (exp education, dental/ or exp schools, dental/ or exp students, dental/)) or ((humanities/ or exp *art/ or exp *literature/ or exp *philosophy, dental/ or (humanities or art or artistic or literature* or philosoph* or painting* or poet* or poem* or drawing or illustrat* or cartoon* or metaphor* or myth* or personal narrative* or music* or theatre* or theater*).ti.) and (exp education, dental/ or (dent* adj3 (educat* or curricul* or school*)).ti.)) and english.la

Line by line:

1. exp humanities/ed	9. exp *philosophy, dental/	17. metaphor*.ti	25. theatre*.ti
2. exp education, dental/	10. art.ti	18. music*.ti	26. or/6-25
3. exp schools, dental/	11. artistic.ti	19. myth*.ti	27. exp education, dental/
4. exp students, dental/	12. cartoon*.ti	20. painting*.ti	28. (dent* adj3 (educat* or curricul* or school*)).ti.
5. 1 and (2 or 3 or 4)	13. drawing.ti	21. personal narrative*.ti	
6. humanities/	14. humanities.ti	22. philosoph*.ti	29. or/27-28
7. exp *art/	15. illustrat*.ti	23. poet*.ti	30. 5 or (26 and 29) and english.la.
8. exp *literature/	16. literature*.ti	24. theater*.ti	

Embase.com

Copy and pastable: 'humanities'/mj OR 'arts and illustration'/exp/mj OR 'history'/exp/mj OR humanities:ti OR art:ti OR artistic:ti OR philosoph*:ti OR poet*:ti OR poem*:ti OR paint*:ti OR literature*:ti OR drawing:ti OR illustrat*:ti OR cartoon*:ti OR metaphor*:ti OR myth*:ti OR 'personal narrative':ti OR 'personal narratives':ti OR music*:ti OR theatre*:ti OR theater*:ti AND ('dental education'/exp/mj OR 'dental student'/exp/mj OR (dent* NEAR/3 (educat* OR school* OR curricul* OR student*)):ti) AND [english]/lim

Line by line:

1. 'humanities'/mj	10. literature*:ti	19. poem*:ti	23. 'dental education'/exp/mj
2. 'arts and illustration'/exp/mj	11. metaphor*:ti	20. theater*:ti	24. 'dental student'/exp/mj
3. 'history'/exp/mj	12. music*:ti	21. theatre*:ti	25. (dent* NEAR/3 (educat* OR school* OR curricul* OR student*)):ti
4. humanities:ti	13. myth*:ti	22. #1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21	
5. art:ti	14. paint*:ti		26. #23 OR #24 OR #25
6. artistic:ti	15. 'personal narrative':ti		27. #22 AND #26 AND [english]/lim
7. cartoon*:ti	16. 'personal narratives':ti		
8. drawing:ti	17. philosoph*:ti		
9. illustrat*:ti	18. poet*:ti		

(continued)

Table 1. Keywords used for each database *(continued)*

ERIC via FirstSearch

Copy and pastable: (su: dentistry OR su: dental w schools OR ti: dent*) AND (su: humanities OR ti: humanities OR ti: art OR ti: artistic OR ti: philosoph* OR ti: poet* OR ti: poem* OR ti: paint* OR ti: literature* OR ti: drawing* OR ti: illustrat* OR ti: cartoon* OR ti: metaphor* OR ti: personal w narrative OR ti: personal w narratives OR ti: myth* OR ti: music* OR ti: theatre* OR ti: theater*)

Line by line:

1. su: dentistry	6. ti: artistic	13. ti: myth*	21. ti: theatre*
2. (su: dental w schools)	7. ti: cartoon*	14. ti: paint*	22. #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21
3. ti: dent*	8. ti: drawing	15. ti: personal w narrative	
4. #1 OR #2 OR #3	9. ti: illustrat*	16. ti: personal w narratives	
5. su: humanities	10. ti: literature*	17. ti: philosoph*	
6. ti: humanities	11. ti: metaphor*	18. ti: poem*	
5. ti: art	12. ti: music*	19. ti: poet*	23. #4 AND #22
		20. ti: theater*	

CINAHL via EBSCOhost

Copy and pastable: (MM "education, dental" OR MM "students, dental" OR MM "schools, dental" OR (TI dent* AND (TI educat* OR TI curricul* OR TI school* OR TI student*))) AND (MM "liberal arts+" OR TI humanities OR TI art OR TI artistic OR TI philosoph* OR TI poet* OR TI poem* OR TI paint* OR TI literature* OR TI drawing OR TI illustrat* OR TI cartoon* OR TI metaphor* OR TI myth* OR TI "personal narrative" OR TI "personal narratives" OR TI music* OR TI theatre* OR TI theater*)

Line by line:

|			
S1. MM "education, dental"	S10. MM "liberal arts+"	S20. TI music*	S29. TI theatre*
S2. MM "students, dental"	S12. TI humanities	S21. TI myth*	S30. (S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S23 OR S24 OR S25 OR S26 OR S27 OR S28 OR S29)
S3. MM "schools, dental"	S13. TI art	S22. TI paint*	
S4. TI dent*	S14. TI artistic	S23. TI "personal narrative"	
S5. TI educat*	S15. TI cartoon*	S24. TI "personal narratives"	
S6. TI curric*	S16. TI drawing	S25. TI philosoph*	
S7. TI student*	S17. TI illustrat*	S26. TI poem*	
S8. TI school*	S18. TI literature*	S27. TI poet*	
S9. S1 OR S2 OR S3 OR (S4 AND (S5 OR S6 OR S7 OR S8))	S19. TI metaphor*	S28. TI theater*	S29. S9 AND S30

DOSS via EBSCOhost

S1. SU "dental schools"	S9. SU humanities	S18. TI music*	S27. TI theatre*
S2. SU "dental students"	S10. TI humanities	S19. TI myth*	S28. (S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S23 OR S24 OR S25 OR S26 OR S27)
S3. TI dent*	S11. TI art	S20. TI paint*	
S4. TI educat*	S12. TI artistic	S21. TI "personal narrative"	
S5. TI curric*	S13. TI cartoon*	S22. TI "personal narratives"	
S6. TI school*	S14. TI drawing	S23. TI philosoph*	
S7. TI student*	S15. TI illustrat*	S24. TI poem*	
S8. S1 OR S2 OR (S3 AND (S4 OR S5 OR S6 OR S7))	S16. TI literature*	S25. TI poet*	
	S17. TI metaphor*	S26. TI theater*	S29. S8 AND S28

In the initial screening process, we identified 760 articles (Figure 1). A secondary review performed by two of the authors (K.M. and A.I.M.) identified 109 additional articles. The total 869 articles were identified based on abstract and/or title. Using the exclusion and inclusion criteria in Table 2 (adapted for dental education from Ousager and Johannessen[10]), we screened all 869 articles and retrieved 272 of them. We carefully read all these articles. In cases in which a full-text version was not available through the University of Michigan library online system, only the abstract was read thoroughly.

We eliminated 24 articles as obviously irrelevant or because no data were obtained (except for the title or key words). Finally, 248 articles were included in our final review and categorization.

To define the relation of each publication to the humanities, we used the typology in Ousager and Johannessen's study.[10] With that typology, we labeled all articles according to type of publication, sector of the major field of humanities treated, any suggested outcome derived from the specified program or activity, and general tone, attitude, or message.
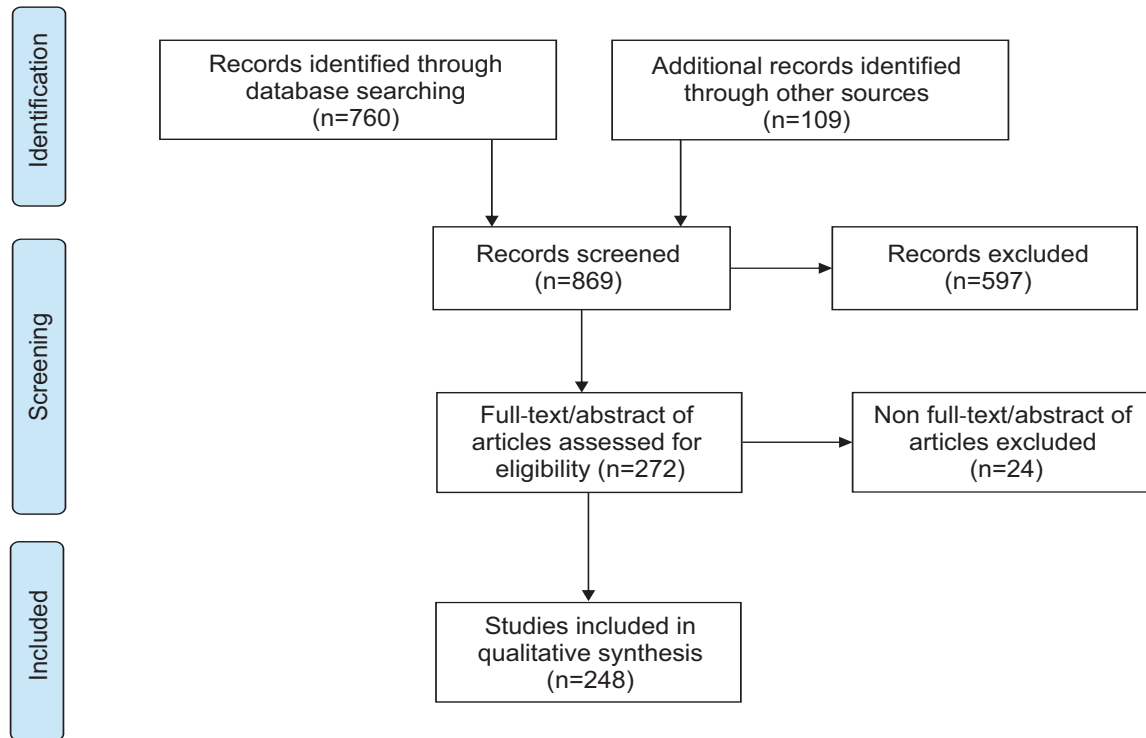
Figure 1. Flow diagram showing screening process used in review

Table 2. Inclusion and exclusion criteria

Parameters	Inclusion Criteria	Exclusion Criteria
Intervention, program, course, curriculum	Viewpoints, descriptions, evaluations, reports Planned, current, completed activities	Admission Clinical/therapeutic uses Other general topics
Subject matter area	Humanities in general, aesthetics, arts, health communication, creative writing, culture, discussion, drama/theater, epistemology, ethics, films, gender studies, history, literature, music, narratives, religion, spirituality	Law, social sciences, and economics
Predoctoral dental education	Related only to predoctoral dental education	Other health professions Advanced dental education

Note: Criteria were adapted for dental education from Ousager J, Johannessen H. Humanities in undergraduate medical education: a literature review. Acad Med 2010;85(6):988-98.

Results

After we applied the inclusion criteria, 248 articles resulted for the analysis. We organized these articles into the following categories: benefits of humanities in dental education, n=57 (Table 3); course descriptions or assessments, n=85 (Table 4); evidence of outcomes (if any), n=66 (Table 5); and attitudes (drawbacks/negative comments or positive/optimistic comments), n=40 (Table 6).

Out of the 248 articles, only 28 referred in a targeted way to humanities in predoctoral dental curricula. The great majority of articles (n=101) focused on professional ethics in dentistry, regarding such topics as principles, education, and decision making; role-modeling by faculty; oath ceremonies and code of professional conduct; and concern about a decline

Table 3. Articles regarding benefits of humanities to dental education (DE) (n=57)

Article/First Author, Reference Number	Area of Humanities	Publication Type/Contents
Karimbux, reference 67	Ethics and professionalism in DE	Editorial
ADEA statement on professionalism in DE, reference 54	Professionalism in DE	Statement by ADEA Task Force on Professionalism in DE
Rosenblum, reference 29	Emotional intelligence and ethics in DE	Essay recommending more emotional, noncognitive input to ethical decision process in DE and practice
Reynolds EC. Dealing with ethical challenges when leading student mission trips. J Am Dent Assoc 2014;145(5):486-7.	Ethics and global DE	Commentary by member of ADA Council on Ethics, Bylaws, and Judicial Affairs
Tyagi, reference 5	Ethics and professionalism in DE	Discussion of significance of ethics and professionalism in DE
Curtis, reference 12	Narrative medicine in DE	Essay on importance of narrative training in communication among health professionals
Cederberg RA, Valenza JA. Ethics and the electronic health record in dental school clinics. J Dent Educ 2012;76(5):584-9.	Ethics and electronic health records (EHRs)	Exploration of ethical issues related to EHRs in dental schools
Lantz MS, Zarkowski P. More on dental school ethics. J Mich Dent Assoc 2008;90(12):12-3.	Ethics and DE	Commentary
Quick KK. My life as a dentist and ethicist: an experiment in creative nonfiction. J Am Coll Dent 2011;78(3):31-2.	Ethics and faculty	Reflection on experiences of a faculty member teaching ethics to dental students
Nash DA. Ethics and the "seasons of my life" as a dental educator. J Am Coll Dent 2011;78(3):18-23.	Ethics and DE	Essay on emergence of author's personal and professional interest in ethics
Graskemper J. Ethics is how you respond to life. J Am Coll Dent 2011;78(3):14-7.	Ethics and professionalism in DE	Essay on how career shaped author's view of ethics in dentistry through ethics and law
Nash DA. Ethics, empathy, and the education of dentists. J Dent Educ 2010;74(6):567-78.	Empathy and ethics in DE	Essay on teaching ethics and empathy in DE
Meru MC. Following your moral compass: ethics in dental school. Ethic Decision Making Dent 2014:13.	Ethics in DE	Extensive presentation of issues related to ethics education in dental school
Schwartz, reference 47	Ethics and oath in DE	Analysis of dental school oaths taken by students in U.S., Canada, and Puerto Rico
Hughes PJ, et al. Academic integrity in dental school: a call to action. J Am Coll Dent 2009;76(2):31-7.	Academic integrity	Position paper on academic misconduct in dental school and how educators can develop strategies to address issue
Ardenghi DM. Dentists' ethical practical knowledge: a critical issue for dental education. Eur J Dent Educ 2009;13(2):69-72.	Ethics in DE	Essay on how DE can foster development of dentists' ethical practical knowledge
Zielinski TJ. Doing nothing about ethics. J Mich Dent Assoc 2008;90(11):16-7.	Ethics in DE	Commentary on dental school ethics
Rosenblum A. A student-initiated movement toward a more positive ethics. J Am Coll Dent 2008;75(2):11-3.	Ethics in DE	Description of student-initiated ethics club
Morton, reference 21	Humanistic DE	Dental student's essay on benefits of humanistic education
Loftis B. Pointing the profession in the right direction: positive ethical movements among dental students and education. J Am Coll Dent 2008;75(2):18-21.	Ethics and academic integrity in DE	Description of proactive role of American Student Dental Association in addressing academic dishonesty and other ethical problems
Lantz MS, Zarkowski P. Can ethics be taught? What students are learning at our two dental schools. J Mich Dent Assoc 2008;90(9):28-35.	Ethics in DE	Ethics teaching at two dental schools in Michigan

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Table 3. Articles regarding benefits of humanities to dental education (DE) (n=57) *(continued)*

Article/First Author, Reference Number	Area of Humanities	Publication Type/Contents
Lucas-Perry E, Akinkugbe A. Bio-ethics in dental education: dental public health residents' perspective. Ethics Biol Eng Med 2011;2(2).	Ethics in DE	Perspectives on bioethics in DE by dental public health residents
Abelson SH. Positive ethics and dental students. J Am Coll Dent 2008;75(2):27-8.	Ethics and academic integrity of dental students	Commentary on how today's dental students differ positively from previous generations
Lingen MW. Tales of academic dishonesty and what do we do about it? Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2006;102(4):429-30.	Academic integrity	Commentary on issue of academic dishonesty
Nash, reference 46	Ethics in DE	Commentary on ethics in dental practice and justification for teaching ethics in DE
Botto RW. Addressing the marketplace mentality and improving professionalism in dental education. J Dent Educ 2007;71(2):217-21.	Professionalism in DE	Letter responding to article on professionalism in DE
Rosenblum A. Our next generation: dental student ethics and its potential influence on the profession. J Calif Dent Assoc 2013;41(7):519-23.	Ethics and professionalism in DE	Discussion of limitations in teaching of ethics in dental schools
Beemsterboer PL. Developing an ethic of access to care in dentistry. J Dent Educ 2006;70(11):1212-6.	Professionalism and ethics in DE	Essay on how DE enhances public service side of professionalism prior to admission and during and after dental school
Peltier BN, et al. White coat principles. J Am Coll Dent 2004;71(4):53-6.	Professionalism and ethics in DE	Proposal for eight white coat ceremony principles
Holden ACL. Reflections on the encouragement of altruism in dental education. Eur J Dent Educ, 7 Dec. 2016.	Altruism in DE	Commentary on need for reform of dental schools' environment to promote altruism
Hunt LM. Dentist's oath of pledge. J Dent Educ 1997;61(8):650.	Ethics in DE	Letter on dentist's oath
Berk, reference 40	Ethics in DE	Overview of trends in ethics teaching in dental schools
Bridgman A, et al. Teaching and assessing ethics and law in the dental curriculum. Br Dent J 1999;187(4):217-9.	Ethics and law in DE	General Dental Council recommendations on importance of ethics and law in dental curricula
Tankersley KC. Academic integrity from a student's perspective. J Dent Educ 1997;61(8):692-3.	Academic integrity	Student essay on professional integrity in DE
McCarthy G. Standardization of ethics education and use of the Hippocratic oath for health science students. J Dent Educ 1997;61(8):649.	Ethics in DE	Hippocratic oath in DE
Peltier B, Dugoni AA. A four-part model to energize ethical conversation. J Calif Dent Assoc 1994;22(10):23-6.	Philosophical ethics in DE	Description of a four-part model on ethics
Christen AG, et al. Why should history be taught in dental school? Bull Hist Dent 1988;36(2):127-32.	History in DE	Commentary
Ozar DT. Formal instruction in dental professional ethics. J Dent Educ 1985;49(10):696-701.	Ethics in DE	Essay on need for formal instruction in dental ethics
Engelhardt HT Jr. Humanism and the profession(al). J Dent Educ 1985;49(4):202-6.	Humanistic education	Description of the humanistic professional
Neidle EA. Dentistry-ethics-the humanities: a three-unit bridge. J Dent Educ 1980; 44(12):693-6.	Humanities and ethics in DE	Essay on history, philosophy, and study of civilization as essential parts of DE

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Table 3. Articles regarding benefits of humanities to dental education (DE) (n=57) *(continued)*

Article/First Author, Reference Number	Area of Humanities	Publication Type/Contents
Vergnes, reference 59	Narrative learning	Essay on use of narrative medicine to cultivate patient-centered dentistry
Lovas, reference 58	Mindfulness in DE	Review of use of mindfulness in teaching professionalism in DE
Curtin S, Trace A. Exploring motivational interviewing and its philosophical alignment to an undergraduate behavioral science program in dentistry. Eur J Dent Educ 2013;17:2,8.	Motivational interviewing (MI) in DE	Review of application of MI in oral health in predoctoral education
Chalfin H. Ethics and professionalism: the past, present, and future. J Am Coll Dent 2006;73(1):42-7.	Ethics and professionalism in DE	Retrospective on foundation of ethics and its importance as touchstone of professionalism
McAndrew, reference 61	Social media in DE	Description of range of Web 2.0 technologies available for use in DE and their potential problems
Nadershahi, reference 27	Humanism in DE	Editorial on creating culture of humanism in dental school
Masella, reference 51	Professionalism in DE	Essay on implementation of professionalism curricula in DE
Spallek, reference 62	Social media in DE	Discussion of how social media has changed DE from personal, professional, and legal perspectives
Spallek, reference 63	Social media in DE	Discussion of development and assessment of knowledge, skills, attitudes, and behaviors needed for dentists to use social media
Carey, reference 28	Communication skills in DE	Systematic review of quality of evidence in communication skills training for dental students
Bertolami CN. Further dialogue on ethics in dental education. J Dent Educ 2005;69(2):229-31.	Ethics in DE	Response to critiques to his prior article
Hoffmann BM, Eriksen HM. The concept of disease: ethical challenges and relevance to dentistry and dental education. Eur J Dent Educ 2001;5:2-8.	Ethics in dental and medical education	Position paper on considerations in ethics education in dentistry and medicine
Jenson LE. Why our ethics curricula do work. J Dent Educ 2005;69(2):225-8.	Ethics in DE	Response to prior article
Graham BS. Educating dental students about oral health care access disparities. J Dent Educ 2006;70(11):1208-11.	Cultural competence in DE	Essay on importance of educating students about access issues
Zijlstra-Shaw S, et al. Assessing professionalism in dental education: the need for a definition. Eur J Dent Educ 2012;16(1):e128.	Professionalism in DE	Literature review
Simon L. Narrative and patient care. J Am Dent Assoc 2015;146(9):654.	Narrative dentistry	Letter
Karimbux NY. From digital native to health care professional. J Dent Educ 2013;77(11):1401.	Media and professionalism in DE	Editorial on use of media in educating dental students about professionalism

Note: Those articles that appear in the references are referred to by last name of first author and reference number; those articles not in the references include full citation.

of ethics and rise of cynicism. We also identified those articles that addressed specific areas or aspects of the humanities, as summarized in the subsequent sections.

Music and Narrative Learning

Anyanwu investigated the ability of background music to enhance the cognitive abilities of students during anatomy courses in the cadaver dissection laboratory.[11] Curtis referred to application of narrative medicine to health care ethics and stated that learning how to receive and tell stories, practiced through close reading, group discussion, and written response, may also facilitate ethical reflection and inquiry.[12] Kieser initiated storytelling as an educational method, nurturing reflective learning in an anatomy course.[13]

Theater

The "forum theater" was described in two studies as a novel method for teaching communication skills to medical or dental students, demonstrating particularly inappropriate communication skills rather than inappropriate attitudes.[14,15] Krüger et al. described the lessons learned from using this method for teaching communication skills.[14]

Bourke described the use of theater as a strategy for oral health education in schools, suggesting that theater is a useful medium for health education of young people.[16] Al-Ahmad found this methodology was a good approach for training dental students in oral surgery, although the use of this active learning methodology was extremely limited.[17] Brett-MacLean et al. tried to explore professionalism in dental and medical education through forum theater, originally created by Brazilian theater director Augusto Boal in 1985 as an approach for promoting dialogue between the audience and those performing on stage ("Theater for the Oppressed").[15] In forum theater, a short scene is performed and repeated while audience members are invited to intervene and offer options to address a problematic situation. These investigators introduced forum theater in an "Introduction to Medicine & Dentistry" course and described how they successfully engaged first-year medical or dental students to reflect on professionalism issues relevant to their experiences using theater.

Empathy

Schwartz and Bohay raised the issue of the importance of empathy in the development of dental students' professionalism with the use of patient videos and interpersonal communications as educational methodologies.[18] Personal construct psychology attracted the interest of another author, who considered it a useful theory for understanding the facilitative process, with an underlying philosophical approach supporting lifelong learning and continuing professional development.[19] Additional articles specifically referred to the benefits of a humanistic model in dental education, emphasizing the importance of teaching compassion, empathy, caring, and desire to give back of students' time, talents, and resources to their communities, the profession, and their schools.[20-27] Empathy was discussed overall in 12 articles.

Communication Skills and Emotional Intelligence

Communication skills in dental education have been discussed by many authors. Carey et al. reported in their systematic review that evidence-based data on learning and assessment of communications skills in dentistry appeared to be of variable quality but indicated that most dental students were receptive to the use of simulated patient interactions as an educational tool.[28] Emotional intelligence was specifically discussed in six articles,[29-34] cultural competence in 27 articles, and humor in one article.[35]

Ethics and Professionalism

Professionalism in dental education was first reported in an article by Shefrin.[20] Morris and Sherlock studied the level of ethics among dental students from three dental schools in California and found that professional ethics declined steadily while cynicism increased, especially in the clinical years.[36] Nash's study of a U.S. dental school curriculum in professional ethics concluded that, if the professional relationship of dentistry to society is to be sustained, each new generation of dentists must understand the nature of the profession and the ethical obligations of becoming a member of the profession.[37] Chaves reported on the experience gained from the development of two new assessment tools, the Dental Ethical Sensitivity Test (DEST) and the Defining Issues Test (DIT), that have been used to measure students' achievement and enhance their skills in this area.[38] Chaves's evidence found that small-group and case-based learning regarding ethical issues improved scores on these measures. Chaves mentioned that it is imperative that opportunities to recognize, analyze, and discuss ethical issues are integrated throughout dental curricula.

Table 4. Articles on course descriptions or assessments related to humanities in dental education (DE), n=85

Article/First Author, Reference Number	Area of Humanities	Publication Type/Findings
Quick, reference 24	Communication skills in DE	Study assessing new method for teaching communication; students found experience to be positive and participation was high
Graham BS, et al. Dental student academic integrity in U.S. dental schools: current status and recommendations for enhancement. J Dent Educ 2016;80(1):5-13.	Professional ethics curricula in DE	National survey study; schools reported various percentages of integrity policies; authors recommend schools add cheating case scenarios to ethics courses
Chen V, et al. Measuring attitudes of dental students towards social accountability following dental education: qualitative findings. Med Teach 2016;38(6):599-606.	Professionalism and social accountability of dental students	Study of dental students regarding social accountability; concluded DE not producing graduates who endorse obligation to address oral health concerns of society
Tiller C. Dentistry and ethics by the road less traveled. J Am Coll Dent 2011;78(3):11-3.	Ethics and dental curriculum	Description of ethics course leading to leadership opportunities in teaching ethics to dental students
Bebeau MJ. The defining issues test and the four-component model: contributions to professional education. J Moral Educ 2002;31(3):271-95.	Ethics in professional DE	Description of defining issues test and assessment methods validated for sensitivity, reasoning, role concept, and ethical implementation
Vivekananda-Schmidt P, et al. A model of professional self-identity formation in student doctors and dentists: a mixed method study. BMC Med Educ 2015;15:83.	Professional self-identity (PSI) of dental students	Study of students' PSI; results provide model of experiences and mechanisms affecting PSI development
Poirier TI, et al. Health professions ethics rubric: validation of reliability in an interprofessional health ethics course. J Dent Educ 2015;79(4):424-31.	Ethics in interprofessional education (IPE)	Study to validate and assess reliability of ethics rubric in IPE ethics course
Ilguy, reference 50	Ethical decision making in DE	Study comparing 4th year dental students' scores pre- and post-ethics course; scores were significantly higher after course
Gadbury-Amyot CC, et al. Self-assessment: a review of the literature and pedagogical strategies for its promotion in dental education. J Dent Hyg 2015;89(6):357-64.	Reflective learning	Review relating theory of self-assessment to DE and describing pedagogical strategies to implement self-assessment in two dental schools
Al-Ahmad, reference 17	Theater-based learning	Cross-sectional student survey comparing theater-based to conventional oral surgery training
Bissell V, Felix DH. The Francis report: implications for education and training of dental professionals. Dent Update 2015;42(3):215-8.	Ethics and professionalism	Essay on importance of education based on ethical principles highlighted in Francis report
Munz, reference 33	Emotional intelligence (EI) in DE	Categorization of EI-related infractions with use of emotional and social competence inventory
Frost PM, et al. Constructing a royal dental hospital shield: a student technical exercise in the 1960s. Dent Historian 2014;59:31-2.	History of DE	Historical article
Donate-Bartfield E, et al. Teaching culturally sensitive care to dental students: a multidisciplinary approach. J Dent Educ 2014;78(3):454-64.	Cultural sensitivity training	Description of multidisciplinary course in culturally sensitive care for dental students
Henry RK, Molnar AL. Examination of social networking professionalism among dental and dental hygiene students. J Dent Educ 2013;77(11):1425-30.	Professionalism and social networking	Study of dental and dental hygiene students' social media use; authors proposed use of media in professionalism training
Nguyen TM, et al. Developing professionalism in dentistry: a systematic review. MedEdPublish 17 May 2017:6.	Evaluation of outcomes of professionalism-related programs	Systematic review based on Kirkpatrick's hierarchy showed mostly low levels of outcomes

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Table 4. Articles on course descriptions or assessments related to humanities in dental education (DE), n=85 *(continued)*

Article/First Author, Reference Number	Area of Humanities	Publication Type/Findings
Gorkey S, et al. Towards a specific approach to education in dental ethics: a proposal for organizing the topics of biomedical ethics for dental education. J Med Ethics 2012;38(1):60-3.	Ethics in DE	Description of organization of ethics education in a Turkish dental school
Flaitz CM, et al. The journey beyond silos: teaching and learning interprofessional ethics at UTHealth. Tex Dent J 2011; 128(8):716-26.	Ethics in interprofessional education	Description of development of interprofessional ethics course
Erratt, reference 48	Ethics in DE	Qualitative study of dental, medical, and pre-dental students and faculty on barriers to ethics education
Chambers DW. Developing a self-scoring comprehensive instrument to measure Rest's four-component model of moral behavior: the moral skills inventory. J Dent Educ 2011;75(1):23-35.	Ethics and moral behavior	Development and validation of moral skills inventory used in DE to measure Rest's four component model of moral behavior
Yusof ZY, et al. Malaysian dental graduates' competence in holistic care: what do graduates and employers think? J Dent Educ 2010;74(12):1380-7.	Holistic care and DE	Study evaluating 19 competencies of dental graduates and employers in holistic care in a Malaysian university
Brondani MA, Rossoff LP. The "hot seat" experience: a multifaceted approach to the teaching of ethics in a dental curriculum. J Dent Educ 2010;74(11):1220-9.	Ethics in DE	Description of three pedagogies to teach ethics: "hot seat" experience, small-group presentations of ethical cases, and student reflections from SP encounters
Schwartz B. An innovative approach to teaching ethics and professionalism. J Can Dent Assoc 2009;75(5):338-40.	Ethics in DE	Description of innovative course teaching ethics and professionalism in a North American dental school
Lantz MS. Dental students persuade the Michigan Dental Association to strengthen its codes of ethics: do actions speak louder than words? J Am Coll Dent 2008;75(2):22-6.	Codes of ethics and DE	Case study of how four groups (including 1st year dental students) viewed proposed language in professional ethics
McCabe DL, et al. Values and ethical decision making among professional school students: a study of dental and medical students. Prof Ethics 1992;1(3/4):117-36.	Ethical decision making in dental and medical education	Survey of dental and medical students using Rokeach terminal values scale, demographic data, and responses to five ethical decision cases
Patthoff DE. The need for dental ethicists and the promise of universal patient acceptance. J Dent Educ 2007;71(2):222-6.	Ethics in DE	Response to article on professionalism in DE; endorsed need for dental ethicists
Christen, reference 52	Art and ethics in DE	Essay on history and ethical lessons from a sculpture at a Spanish university
Garetto LP, Senour WE. Using an ethics across the curriculum strategy in dental education. J Am Coll Dent 2006;73(4):33-7.	Ethics and professionalism in DE	Description of ethics and professionalism instruction in a North American university
Gadbury-Amyot CC, et al. Using a multi-faceted approach including community-based service-learning to enrich formal ethics instruction in a dental school setting. J Dent Educ 2006;70(6):652-61.	Ethics in DE	Study of dental and dental hygiene students' attitudes pre and post 7-week ethics course; significant differences found from beginning to end of course
Salveson C. Interdisciplinary ethics course for nursing, dental, and medical students. Commun Nurs Res 2005;38:193.	Ethics in interprofessional education	Study of dental, nursing, and medical students
Gillet D, et al. Is there a link among writing ability, drawing aptitude, and manual skills of dental students? Eur J Dent Educ 2002;6(2):69-73.	Writing and drawing skills in relation to dental skills	Study testing relation between dental students' manual aptitude in writing/drawing tests and practical assessment results
Zarkowski, reference 41	Ethics in DE	Description of four-year curriculum of ethics courses at a North American dental school

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Table 4. Articles on course descriptions or assessments related to humanities in dental education (DE), n=85 *(continued)*

Article/First Author, Reference Number	Area of Humanities	Publication Type/Findings
Crutchfield P, et al. The limits of deontology in dental ethics education. Int J Ethics Educ 2016;1(2):183-200.	Dental ethics education	Survey found adherence to duties compared to caring had weaker association with students' ethical judgments and behavior
Bebeau MJ. Does this integrated law and ethics curriculum promote ethical thinking? J Am Coll Dent 2001;68(2):27-30.	Ethics in DE	Analysis of combined ethics and law four-year curriculum
Ozar, reference 39	Ethics in DE	History of ethics education in dental and dental hygiene programs from 1980s
Nash, reference 37	Ethics and professionalism in DE	Description of professionalism course across predoctoral curriculum
Díaz-Narváez VP, et al. Empathy and gender in dental students in Latin America: an exploratory and cross-sectional study. Health 2015;7(11):1527.	Empathy in DE	Cross-sectional study of dental students' empathy levels measured by Jefferson scale of empathy; variable results for both genders
Nolan PW, Smith J. Ethical awareness among first-year medical, dental, and nursing students. Int J Nurs Stud 1995;32(5):506-17.	Ethics in interprofessional education	Study of ethical views and knowledge of medical, dental, and nursing students in response to vignettes
Pollack BR. Teaching law, ethics, and risk management at the School of Dental Medicine State University of New York at Stony Brook. J Law Ethics Dent 1989;2(1):32-49.	Ethics, law, and risk management in DE	Description of course in law, ethics, and risk management taught since 1977 and revised in 1988
Feldman CA, et al. Teaching ethics, jurisprudence, and risk management at the New Jersey Dental School. J Law Ethics Dent 1989;2(2):101-6.	Ethics and law in DE	Description of teaching ethics, jurisprudence, and risk management to dental students and faculty
Hasegawa TK Jr. Professional ethics instruction at Baylor College of Dentistry. J Law Ethics Dent 1988;1(4):230-2.	Ethics and law in DE	Description of instruction in professional ethics for dental students
Clarke JH, et al. The content of a dental history course: what should be taught? Bull Hist Dent 1988;36(2):134-9.	History in DE	Description of a dental history course
Odom JG. Teaching dental students to solve ethical problems. Dentistry (Chicago) 1987;7(2):16-8.	Ethics and cognitive development in DE	Essay
Bebeau MJ, et al. Measuring dental students' ethical sensitivity. J Dent Educ 1985;49(4):225-35.	Ethical sensitivity and moral reasoning in DE	Study of dental students found high internal consistency compared to previous efforts to study sensitivity
Bebeau MJ. Teaching ethics in dentistry. J Dent Educ 1985;49(4):236-43.	Ethics in DE	Description of course to help dental students identify and resolve ethical problems
Odom JG. Parameters and goals for teaching ethics. Ohio Dent J 1984;58(3):36-9.	Ethics in DE	Description of parameters and goals for teaching ethics to dental students
Nordstrom WR, et al. How a dental museum, built and staffed by dental students, helps generate interest in dental history. Bull Hist Dent 1983;31(1):18-22.	History in DE	Description of a dental museum built and staffed by dental students and its association with teaching dental history
Bebeau MJ. Professional responsibility curriculum report: American College fellows serve as expert assessors. J Am Coll Dent 1983;50(2):20-3.	Professionalism in DE	Report on teaching ethics with American College fellows serving as expert assessors
Shefrin, reference 20	Professionalism and ethics in DE	Description of role-playing method to teach professionalism and ethics
Miller SL. Self-instruction as a means for teaching the history of dentistry. Bull Hist Dent 1973;21(2):95-100.	History in DE	Description of self-instruction as method for teaching history of dentistry

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Table 4. Articles on course descriptions or assessments related to humanities in dental education (DE), n=85 *(continued)*

Article/First Author, Reference Number	Area of Humanities	Publication Type/Findings
Mock JI, et al. New approach to drawing in dental anatomy. J Dent Educ 1968;32(3):279-82.	Art (drawing) in DE	Description of drawing as teaching approach in dental anatomy
Brett-MacLean, reference 15	Art (theater) in DE	Description of teaching professionalism in DE based on ForumTheater created by Brazilian director Augusto Boal
Wener ME, et al. Developing new dental communication skills assessment tools by including patients and other stakeholders. J Dent Educ 2011;75(12):1527-41.	Holistic dentistry and communication skills education	Study of dental students and assessment development
Zahra, reference 22	Art and humanities in DE	Description of pilot 6-session course integrating arts and humanities in DE
Brondani MA. Students' reflective learning in a community service-learning dental module. J Dent Educ 2010;74(6):628-36.	Reflective learning	Study analyzing dental students' reflections before, during, and after community learning; results showed positive impact on attitudes about service and community members
Oakley, reference 60	Social media in DE	Call for research on professionalism and social media in DE
Victoroff, reference 30	Emotional intelligence (EI) in DE	Study of relationship between dental students' EI and clinical performance
Brett-MacLean PJ, et al. Film as a means to introduce narrative reflective practice in medicine and dentistry: a beginning story presented in three parts. Reflect Pract 2010;11(4):499.	Narrative reflective learning	Pilot test of film-based module with medical and dental students; feedback supported its use
Tsang KL, Walsh LJ. Oral health students' perceptions of clinical reflective learning: relevance to their development as evolving professionals. Eur J Dent Educ 2010;14(2):99.	Reflective learning	Description of clinical reflective learning course in curriculum of an Australian oral health program; students perceived program positively
Tricio J, et al. Dental students' reflective habits: is there a relation with their academic achievements? Eur J Dent Educ 2015;19(2):113.	Reflective learning	Cross-sectional study of reflection habits of dental students and PhD trainees
Novak KF, et al. Students' perceived importance of diversity exposure and training in dental education. J Dent Educ 2004;68(3):355-60.	Diversity issues	Survey of dental students supported importance of diversity exposure and training in dental school
Donate-Bartfield E, Lausten L. Why practice culturally sensitive care? Integrating ethics and behavioral science. J Dent Educ 2002;66(9):1006-11.	Cultural competence	Description of teaching method with clinical vignettes; proposal to integrate ethics and behavioral science
Gregorczyk SM, Bailit HL. Assessing the cultural competence of dental students and residents. J Dent Educ 2008;72(10):1122-7.	Cultural competence	Literature review of cultural competence education in health professions and instruments to assess student knowledge and clinical performance
Rowland ML, et al. A snapshot of cultural competence in U.S. dental schools. J Dent Educ 2006;70(9):982-90.	Cultural competence	National (U.S.) survey of cultural competence courses; found little standardization and variety of methods
Saleh L, et al. An assessment of cross-cultural education in U.S. dental schools. J Dent Educ 2006;70(6):610-23.	Cultural competence	National (U.S.) survey of cross-cultural education; found variety of teaching and evaluation methods
Forsyth CJ, et al. Teaching cultural competence in dental education: a systematic review and exploration of implications for indigenous populations in Australia. J Dent Educ 2017;81(8):956-68.	Cultural competence	Literature review of cultural competence interventions in Australian dental curricula

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Table 4. Articles on course descriptions or assessments related to humanities in dental education (DE), n=85 *(continued)*

Article/First Author, Reference Number	Area of Humanities	Publication Type/Findings
Ratzmann A, et al. Early patient contact in undergraduate dental education in Germany: the Greifswald model. Eur J Dent Educ 2007;11:93-8.	Communication skills in DE	Description of new teaching concept in German DE based on interactions between community medicine and dentistry
Gorter RC, Eijkman AJ. Communications skills training courses in dental education. Eur J Dent Educ 1997;1:143-7.	Communication skills in DE	Description of three courses at a Dutch dental school and results of students' evaluation
Sherman JJ, Cramer A. Measurement of changes in empathy during dental school. J Dent Educ 2005;69(3):338-45.	Empathy in DE	Analysis of psychometric properties of measure of empathy applied to dental students
Croft P, et al. Evaluation by dental students of a communication skills course using professional role players in a UK school of dentistry. Eur J Dent Educ 2005;9:2-9.	Communication skills in DE using professional role players	Study of student feedback on a role play methodology used in behavioral sciences teaching
Hannah A, et al. A communication skills course for undergraduate dental students. J Dent Educ 2004;68(9):970-7.	Communication skills in DE	Description of communication skills course with simulated patients, case-based scenarios, etc.
Lanning SK, et al. Communication skills instruction utilizing interdisciplinary peer teachers: program development and student perceptions. J Dent Educ 2008;72(2):172-82.	Communication skills in DE	Cross-sectional study found students perceived a knowledge-observation-simulation-experience course to be worthwhile
Teplitsky PE. Perceptions of Canadian dental faculty and students about appropriate penalties for academic dishonesty. J Dent Educ 2002;66(4):485-506.	Academic integrity	Study comparing perceptions of dental faculty and students on academic dishonesty penalties; jurisprudence grid for appropriate disciplinary action presented
Theaker ED, et al. Development and preliminary evaluation of an instrument designed to assess dental students' communication skills. Br Dent J 2000; 188(1):40-4.	Communication skills in DE	Study assessed inter-observer reliability of instrument to evaluate dental students' communication skills
Bailit HL, et al. The origins and design of the dental pipeline program. J Dent Educ 2005;69(2):232-8.	Cultural competence; minorities in DE	Description of program aiming to reduce disparities in access to dental care; 15 U.S. dental schools participated
Leviton LC. Foreword: evaluating the dental pipeline program. J Dent Educ 2009;73(2 Suppl):S5-7.	Cultural competence; minorities in DE	Evaluation of the dental pipeline program at 15 U.S. dental schools
Brondani MA, et al. An evolving community-based dental course on professionalism and community service. J Dent Educ 2008;72(10):1160-8.	Professionalism and community practice in DE	Description of professionalism and community service course using community-based dental education as experiential learning pedagogy
Cannick GF, et al. Use of the OSCE to evaluate brief communications skills training for dental students. J Dent Educ 2007;71(11):1203-9.	Communication skills in DE	Study using OSCE to evaluate dental students' competence in interpersonal and tobacco cessation communication skills
Orsini, reference 34	Communication skills and emotional intelligence (EI) in DE	Study of dental faculty definition of dentist-patient relationship skills informed by EI concepts
Aleksejuniene J, et al. Self-perceptions of cultural competence among dental students and recent graduates. J Dent Educ 2014;78(3):389-400.	Cultural competence in DE	Study assessed self-perceptions of cultural competence of students and recent graduates of a Canadian dental school
Victoroff KZ, et al. Dental students' reflections on their experiences with a diverse patient population. J Dent Educ 2013;77(8):982-9.	Cultural competence	Qualitative study exploring students' reflections on their interactions with a diverse patient population in a clinical setting
Whitehead AW, Novak KF. A model for assessing the ethical environment in academic dentistry. J Dent Educ 2003;67(10):1113-21.	Ethics in DE	Proposal to use Weber's institutional ethics audit model to assess dental schools' ethical environment

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Table 4. Articles on course descriptions or assessments related to humanities in dental education (DE), n=85 *(continued)*

Article/First Author, Reference Number	Area of Humanities	Publication Type/Findings
Raja S, et al. Teaching dental students about patient communication following an adverse event: a pilot educational module. J Dent Educ 2014;78(6):757-62.	Communication skills in DE	Description of six-hour pilot module to improve dental students' knowledge and confidence in communicating with patients about adverse events
Andrews KG, et al. Faculty and student perceptions of academic integrity at U.S. and Canadian dental schools. J Dent Educ 2007;71(8):1027-39.	Academic integrity in DE	U.S. and Canada survey; results showed significant differences between students' and faculty members' perceptions of academic integrity
Gonzalez MG, et al. Soft skills and dental education. Eur J Dent Educ 2013;17(2):73-82.	Communication skills in DE	Description of teaching and assessment of soft skills and model for soft skills teaching

Note: Those articles that appear in the references are referred to by last name of first author and reference number; those articles not in the references include full citation.

Ozar traced the development of ethics education in dentistry in the 1980s and later, highlighting the creation of PEDNET (the Professional Ethics in Dentistry Network), the appearance of several textbooks and journals featuring ethics columns, and the approval of formal guidelines for teaching ethics by the American Association of Dental Schools.[39] Berk stated that promotion of ethical behavior in dental students was reflected in the emphasis on formal ethics teaching.[40] He noted, in 2001, that state-of-the-art ethics education had moved from purely didactic to more interactional methodologies that promote student introspection and group problem-solving. Zarkowski and Graham described a predoctoral dental curriculum in which professional ethics were the basic core of humanities education, with a course on issues that students face for each stage of professional development.[41] In addition, in an "Ethics Rounds" course, students presented a personal patient-based ethics case. Spike described the development of a medical humanities concentration, which motivated students to continue to pursue their humanistic interests in the third and fourth years of medical school.[42] Welie emphasized that ethics education in dental schools can improve students' ability to reflect on ethical alternatives, but expressed his opinion that the most powerful influence for professional behavior comes from faculty role-modeling.[43]

Bertolami's exploration of "why our ethics curricula don't work" highlighted three specific weaknesses he identified in a typical ethics curriculum: 1) failure to recognize that more education is not the answer to everything, 2) ethics is boring, and 3) course content is qualitatively inadequate because it does not foster an introspective basis for true behavioral change.[44] A fourth element—innovation—was directed to the third weakness and entailed implementing a "pre-curriculum" early in the curriculum to address the disconnect between knowledge and action. Sharp et al., underlining the importance of ethical engagement for dental students, stated that faculty who teach ethics must select a limited set of topics from the broad fields of professional ethics, bioethics, and the humanities.[45]

Nash stated that a variety of instructional methods are available and appropriate for teaching professional ethics, including lectures, readings, books, case scenarios, literature reviews, portfolios, role-plays, debates, general discussions, and cinema.[46] Venues for instruction include classroom, websites, clinics, and the community, with methodologies utilized for engaging students being limited only by the creativity of the teacher. While some institutions had engaged professional philosophers, ethicists, or behavioral scientists to teach ethics to dental students, Nash noted his preference that dentists who are knowledgeable in the field of ethics teach these courses since instruction by a clinician enhances the relevance and validity of the subject matter to a student who is studying to become a dentist. Classroom and clinic protocols that promote basic concepts of morality must be established, Nash noted, to promote and reinforce the specific principles of ethics related to dentistry. Schwartz et al. reviewed and analyzed the importance of oaths, principles of ethics, and codes of professional conduct, considering oath-taking as an opportunity to instill in students important ethical obligations in dentistry, and they provided recommendations to make the content more meaningful and comprehensive.[47] Schwartz and Bohay discussed the involvement of ethics and professionalism with interpersonal communications in dental education.[18]

Table 5. Articles with evidence of outcomes regarding use of humanities in dental education (DE) (n=66)

Article/First Author, Reference Number	Area of Humanities	Publication Type/Contents
Anyanwu, reference 11	Background music in basic sciences and anatomy education	Study found medical and dental students who studied with background music had significantly higher scores on overall exams than those who did not
Hillenburg, reference 71	Cultural competence; lesbian, gay, bisexual, and transgender (LGBT) issues	National (U.S.) survey found strategies for increasing LGBT content were curricular material on LGBT health issues and health disparities and having trained faculty teach LGBT content
Ford PJ, Hughes C. Academic integrity and plagiarism: perceptions and experience of staff and students in a school of dentistry. Eur J Dent Educ 2012;16(1):e180-6.	Academic integrity	Survey study to investigate perceptions and experience of plagiarism and assess usefulness of workshops; results showed enhanced understanding of plagiarism
Bebeau MJ. Designing an outcome-based ethics curriculum for professional education: strategies and evidence of effectiveness. J Moral Educ 1993;22(3):313-26.	Ethics in DE	Description of curriculum addressing ethical sensitivity, moral reasoning, moral motivation, and moral implementation
Escudier MP, et al. Student acceptability of high-stakes e-assessment in dental education: using privacy screen filters to control cheating. J Dent Educ 2014; 78(4):558-66.	Academic integrity	Study found privacy filters used in e-assessment improved dental students' confidence in fairness of computer-based assessments
Behar-Horenstein LS, et al. An assessment of faculty and dental student decision-making in ethics. J Am Coll Dent 2014;81(4):44-50.	Ethical decision making	Study compared dental student and faculty scores to national norms on Defining Issues Test 2, a measure of ethical decision making; results showed both groups tended to make decisions that promoted self-interest
Al-Zain, reference 49	Professional ethics in DE	Cross-sectional study of dental students and recent graduates found all considered professional ethics a very important prerequisite for dental practice
Tabei SZ, et al. Investigation of awareness of the students of Shiraz dental school concerning patients' rights and principles of ethics in dentistry. J Dent 2013;14(1):20-4.	Ethics in DE and patients' rights	Study investigated dental students' awareness of and attitudes on patients' rights and principles of dental ethics; 71% were acquainted with patients' rights
Nelson, reference 25	Humanistic dentistry	Study showed feasibility of measuring dental students' humanistic qualities in 1st year; these qualities were associated with clinical performance in 3rd year
Madhan, reference 35	Sense of humor (SoH) among dental students	Study in which dental students completed Multidimensional Sense of Humor Scale and Depression Anxiety Stress Scales-21; further research was needed to correlate SoH and role of humor
Asokan S, et al. Attitudes of students and teachers on cheating behaviors: descriptive cross-sectional study at six dental colleges in India. J Dent Educ 2013;77(10):1379-83.	Academic integrity	Descriptive cross-sectional study compared attitudes of students and teachers on cheating behaviors in six dental colleges
You, reference 69	Ethics and gender differences	Retrospective study found dental students' gender differences were not apparent for moral sensitivity, but were for one of the moral reasoning indices
Schwartz, reference 18	Professionalism and empathy in DE	Study on students' perceptions of integrating patients' voices into patient management course; students reported enhanced awareness of importance of empathy
Kurkowski MA. Off on the right foot. Northwest Dent 2012;91(4):41-2.	Professionalism	Study of dental students using digital videos and one-on-one interviews

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Table 5. Articles with evidence of outcomes regarding use of humanities in dental education (DE) (n=66) *(continued)*

Article/First Author, Reference Number	Area of Humanities	Publication Type/Contents
Koletsi-Kounari, reference 68	Academic integrity	Study in which dental faculty and students selected penalties for hypothetical offenses; in results, faculty were harsher than students for same offenses
Al-Johany, reference 53	Writing and drawing skills of junior dental students	Study evaluated fine motor skills of dental students; results supported use of handwriting and basic drawing skills for initial evaluations
Brands WG, et al. The chasm between knowing and choosing the ethical course of action: a survey of dental students in the Netherlands. Int Dent J 2010;60(5):321-8.	Ethics and law in DE	Survey found dental students' knowledge of health law increased from 1st to 5th years, but knowledge of ethics decreased
Sharp HM, et al. What do dental students learn in an ethics course? An analysis of student-reported learning outcomes. J Dent Educ 2008;72(12):1450-7.	Ethics in DE	Study of 1st year dental students' perceptions of ethics and professionalism course; results showed increased awareness of professional role
Rubin RW, et al. Exploring dental students' perceptions of cultural competence and social responsibility. J Dent Educ 2008;72(10):1114-21.	Cultural competence and social responsibility	Study found improvement in dental students' attitudes about community service and cultural competence after participation in non-dental community service
Kieser, reference 13	Professional storytelling in dental anatomy education	Study found evidence that storytelling nurtured reflective learning while students learned clinical anatomy
Hamel O, et al. Ethical reflection in dentistry: first steps at the Faculty of Dental Surgery of Toulouse. J Am Coll Dent 2006;73(3):36-9.	Ethical reflection in DE	Survey of dental students, faculty, and department heads found most respondents favored teaching of ethics
de Freitas SF, et al. Stages of moral development among Brazilian dental students. J Dent Educ 2006;70(3):296-306.	Moral reasoning in DE	Study found level of moral and ethical development of 1st year dental students was low
Sharp, reference 45	Ethics in DE	Study collected 4th year dental students' reports of ethical issues during community-based clinical experiences as foundation for designing practical dental ethics instruction
Krüger, reference 14	Communication skills education with drama	Study assessed medical and dental students' knowledge of communication skills pre- and post-intervention; found "forum theater" transferred knowledge of communication skills
Acharya S. The ethical climate in academic dentistry in India: faculty and student perceptions. J Dent Educ 2005;69(6):671-80.	Ethical educational environment	Study assessed ethical climate in an Indian dental school; results showed need for better communication of ethical policies
Schwartz B. A call for ethics committees in dental organizations and in dental education. J Am Coll Dent 2004;71(2):35-9.	Ethics in DE	Survey of Canadian faculties of dentistry regarding ethics resources
Rubin RW. Developing cultural competence and social responsibility in preclinical dental students. J Dent Educ 2004;68(4):460-7.	Cultural competence and social responsibility	Study in which dental students participated in non-dental community service; intervention resulted in enhanced cultural understanding
Röding K. Human sciences in the first semester of the dental undergraduate course at the Karolinska Institute, Stockholm. Eur J Dent Educ 1999;3(3):106-8.	Human sciences in DE	Study assessing course introducing students to professionalism in patient-related health sciences; results showed students were positive about theme as a whole and specific seminars
Chaves, reference 38	Ethics in DE	Study using Dental Ethical Sensitivity Test and Defining Issues Test to assess development of ethical sensitivity reflective reasoning
Bebeau MJ, Thoma SJ. The impact of a dental ethics curriculum on moral reasoning. J Dent Educ 1994;58(9):684-92.	Ethics in DE	Study of dental students using Defining Issues Test; in results, they benefitted from and valued ethics education

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Table 5. Articles with evidence of outcomes regarding use of humanities in dental education (DE) (n=66) *(continued)*

Article/First Author, Reference Number	Area of Humanities	Publication Type/Contents
Díaz-Narváez VP, et al. Levels of empathy among dental students in five Chilean universities. Health 2016;8(1):32.	Empathy in DE	Study validated Jefferson Scale of Physician Empathy (in Spanish) in Chile as adapted for dental students; results showed great variability of empathetic guidance
Odom JG. The status of dental ethics instruction. J Dent Educ 1988;52(6):306-8.	Ethics in DE	Survey found dental schools providing ethics instruction often confused law, jurisprudence, and avoidance of malpractice with ethics
Odom JG. Formal ethics instruction in dental education. J Dent Educ 1982;46(9):553-7.	Ethics in DE	Study found 3/4 of respondents had some commitment to teaching ethics but there was no agreement about content of instruction
Morris, reference 36	Professional ethics and cynicism in DE	Longitudinal study of professional socialization found that professional ethics declined and cynicism increased
Miller SL, et al. Programmed course in dental ethics compared with two other methods of instruction. J Public Health Dent 1970;30(4):229-33.	Ethics in DE	Study of intervention used for ethics found it was not as effective as two other instruments available
Strauss R, et al. Reflective learning in community-based dental education. J Dent Educ 2003;67(11):1234-42.	Reflective learning	Essay recommending reflection to increase impact of learning in community-based education
Mofidi M, et al. Dental students' reflections on their community-based experiences: the use of critical incidents. J Dent Educ 2003;67(5):515-23.	Reflective learning	Study found dental students' reflections on critical incidents in community-based education facilitated professional development
Beemsterboer PL, et al. Issues of academic integrity in U.S. dental schools. J Dent Educ 2000;64(12):833-8.	Academic integrity	National (U.S.) survey found incidents of academic dishonesty occurred in most dental schools
Wilhelm M, et al. Interprofessional ethics learning between schools of pharmacy and dental medicine. J Interprof Care 2014;28(5):478-80.	Interprofessional ethics education	Study assessed dental and pharmacy students using Readiness for Interprofessional Learning Scale and for knowledge pre and post intervention; results found it increased knowledge of ethical decision making
Bush H, Bissell V. The evaluation of an approach to reflective learning in the undergraduate dental curriculum. Eur J Dent Educ 2008;12(2):103-10.	Reflective learning	Study of dental students' reflections found limited encouragement that they were acquiring skills for professional reflection
Sharp HM, Kuthy RA. What do dental students learn in an ethics course? An analysis of student-reported learning outcomes. J Dent Educ 2008;72(12):1450-7.	Professionalism in DE	Study assessed 1st-year dental students' perceptions of their primary learning outcomes from course in ethics and professionalism
Alrqiq HM, et al. Evaluating a cultural competence curriculum: changes in dental students' perceived awareness, knowledge, and skills. J Dent Educ 2015;79(9):1009-15.	Cultural competence	Curriculum evaluation in U.S. dental school found it was effective in improving students' cultural competence knowledge and skills
Lyon, reference 26	Humanistic environment in DE	Study of student and faculty perceptions of humanistic environment; respondents described humanism as manifest by attributes such as caring, understanding, respect, and compassion
Pilcher ES, et al. Development and assessment of a cultural competence curriculum. J Dent Educ 2008;72(9):1020-8.	Cultural competence	Study of pre- and posttest scores found curriculum contributed to students' cultural knowledge and self-awareness
Wagner J, et al. Dental student attitudes towards treating diverse patients: effects of a cross-cultural patient-instructor program. J Dent Educ 2008;72(10):1128-34.	Cultural competence	Study assessed cross-cultural patient-instructor (PI) program on dental students' attitudes about diversity; results found PIs were creative way to promote cross-cultural patient care

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Table 5. Articles with evidence of outcomes regarding use of humanities in dental education (DE) (n=66) *(continued)*

Article/First Author, Reference Number	Area of Humanities	Publication Type/Contents
Wagner JA, Redford-Badwal D. Dental students' beliefs about culture in patient care: self-reported knowledge and importance. J Dent Educ 2008;72(5):571-6.	Cultural competence	Study of effect of course to increase knowledge of other cultures; results showed dental students needed cross-cultural training and found it important
Richards PS, Inglehart MR. An interdisciplinary approach to case-based teaching: does it create patient-centered and culturally sensitive providers? J Dent Educ 2006;70(3):284-91.	Cultural competence	Study found interdisciplinary, case-based teaching increased students' appreciation of complexity of patient care and of a patient-centered, culturally sensitive approach to diagnosis
Broder HL, Janal M. Promoting interpersonal skills and cultural sensitivity among dental students. J Dent Educ 2006;70(4):409-16.	Cultural competence	Study of effects of two clinical communications sessions; results showed statistically significant increases in communication skills for each session
Wagner J, et al. A patient-instructor program to promote dental students' communication skills with diverse patients. J Dent Educ 2007;71(12):1554-60.	Cultural competence	Study of patient-instructor program to teach and assess dental students' communication skills; results pointed to curriculum changes to improve skills
Pau, reference 32	Emotional intelligence (EI) in DE	Multinational survey found inverse relationship between EI and stress in diverse contexts
Beattie A, et al. Does empathy change in first-year dental students? Eur J Dent Educ 2012;16(1):e111-6.	Empathy in DE	Study used modified Jefferson Scale of Physician Empathy to assess cognitive-affective aspect of students' empathy
Muhney KA, Campbell PR. Allied dental and dental educators' perceptions of and reporting practices on academic dishonesty. J Dent Educ 2010;74(11):1214-9.	Academic integrity	Study found majority of educators had observed cheating and perceived disparities between students and educators and among cultural groups in defining academic dishonesty
Bebeau MJ, Loupe MJ. Masculine and feminine personality attributes of dental students and their attitudes toward women's roles in society. J Dent Educ 1984;48(6):309-14.	Gender issues in DE	Study of dental students with academic psychologists found successful professionals had similar personality traits regardless of gender
Coombs JA. Factors associated with career choice among women dental students. J Dent Educ 1976;40(11):724-32.	Gender issues in DE	Study found male and female students differed significantly in time of career decision, factors influencing decision, previous dental-related work experience, and parents' work and educational history
Hottell TL, Hardigan PC. Improvement in the interpersonal communication skills of dental students. J Dent Educ 2005;69(2):281-4.	Communication skills in DE	Study evaluated students pre- and post-psychology course; results showed significantly higher interpersonal skills after course
Gadbury-Amoyt CC, et al. Using a multi-faceted approach including community-based service-learning to enrich formal ethics instruction in a dental school setting. J Dent Educ 2006;70(6):652-61.	Ethics in DE	Study assessed student attitudes pre- and post-community service-learning; results showed statistically significant differences in attitudes and by gender regarding impact on career choice
Hewlett ER, et al. Effect of school environment on dental students' perceptions of cultural competence curricula and preparedness to care for diverse populations. J Dent Educ 2007;71(6):810-8.	Cultural competence	Study used results from 2013 ADEA survey of dental seniors to aid in development of cultural competence curricula and directions for future study
Haak R, et al. The effects of undergraduate education in communication skills: a randomized controlled clinical trial. Eur J Dent Educ 2008;12:213-318.	Communication skills in DE	Randomized trial of dental students found significantly greater improvement of communication skills in test group than control group
Aalboe JA, Schumacher MM. An instrument to measure dental students' communication skills with patients in six specific circumstances: an exploratory factor analysis. J Dent Educ 2016;80(1):58-64.	Communication skills in DE	Survey of 2nd-year dental students in a communication skills course at a U.S. dental school found instrument was useful in assessing development of communication skills

(continued)

Table 5. Articles with evidence of outcomes regarding use of humanities in dental education (DE) (n=66) *(continued)*

Article/First Author, Reference Number	Area of Humanities	Publication Type/Contents
da Graça Kfouri, reference 70	Gender issues and empathy in DE	Study of students in a Brazilian dental school found men wanted more technical learning and instruction in business administration and women were unhappy with personal relationships
Lancaster DM, et al. Dental students' class attitudes: a four-year study. J Am Coll Dent 1989;56:30-5.	Academic integrity	Survey of class attitudes in all four years at a U.S. dental school found while many attitudes remained stable, some had significant changes
Chalkley Y. A survey of minority student recruitment and retention efforts in dental schools. J Dent Educ 1995;59(6):645-8.	Minority recruitment in DE	Survey of overall recruitment and retention of minority students in dental schools
Bedi R, Gilthorpe MS. Social background of minority ethnic applicants to medicine and dentistry. Br Dent J 2000;189:152-4.	Minority recruitment in DE	Retrospective analysis of national (UK) admissions data found significant inter-ethnic differences in social background of students entering medicine and dentistry
Yarascavitch C, et al. Changes in dental student empathy during training. J Dent Educ 2009;73(4):509-17.	Empathy in DE	Study in Canadian dental schools using instrument that separately evaluated emotive and cognitive types of empathy
Field J, et al. Teaching and assessment of professional attitudes in UK dental schools: commentary. Eur J Dent Educ 2010;14:133-5.	Professionalism in DE	Survey of UK dental schools found all responding schools recognized importance of professionalism and reported it was taught and assessed in their curricula
Hannah, reference 31	Emotional intelligence in DE	Study evaluated dental students in New Zealand with Social Skills Inventory; results found women had higher global social skills and were more emotionally expressive and sensitive than men

Note: Those articles that appear in the references are referred to by last name of first author and reference number; those articles not in the references include full citation.

In their study, students accepted new educational methodologies integrating patients' voices into a management course positively; the experience raised their awareness of empathy.

Tyagi et al. pointed out the significance of ethics and professionalism in dental education and concluded that understanding the role of social, economic, environmental, and other factors in determining health status is critical if greater equity in dental education and care is to be achieved.[5] Erratt discussed the importance of pre-health programs in the ethical development of future doctors using multiple strategies, including humanities.[48] Al-Zain et al. noted that generally, in Saudi Arabian dental schools, religious teachings and spirituality were considered as one of the top motives for practicing professional ethics in dentistry.[49] In that instruction, students appreciated professional ethics as a highly significant factor for their success in dental practice and their position in society. Ilguy suggested that dental curricula should increase students' awareness of ethical issues.[50] Finally, Masella stated that "institutional consensus on professionalism should be developed among faculty, administration, and students through passionate advocacy and careful analysis of dentistry's moral convictions."[51]

Art

Christen and Christen, in their article about ethics, observed the equestrian sculpture "The Torch Bearers" at the University of Madrid Dental School and concluded that the torch of learning and thinking is passed on.[52] They stated that computer technology used exclusively as a mode of teaching and learning cannot become a substitute for interactive methods, which emphasize human-to-human interaction. Connections between art and dental education were also discussed by Al-Johany[53] and Anyanwu.[11]

Cultural Competence

Finally, cultural competence was discussed in 27 articles. Quick extensively discussed the need for integration of humanities in dental education, through collegial conversations, reflective practice,

Table 6. Articles about attitudes regarding use of humanities in dental education (DE) (n=40)

Article/First Author, Reference Number	Area of Humanities	Publication Type/Contents
Lew S. Are dentists avoiding their metaphorical vegetables? Br Dent J 2016;221(9):536.	Communication skills, ethics, and professionalism in DE	Letter on "soft skills" such as ethics, communication, and professionalism
Patrick AC. A review of teaching ethics in the dental curriculum: challenges and future developments. Eur J Dent Educ 2017;21(4):e114-8.	Ethics in DE	Study found, despite improved teaching of ethics, further study is needed to include patient views and develop a theoretically robust approach to self-reflection
Feng, reference 72	Cultural competence, LGBT issues	Study concluded with authors' urging dental school administrators to explore degree to which their programs teach respectful and caring behavior toward LGBT students and patients
Quick, reference 23	Humanistic environment and DE	Study of dental students found greater effort should be directed toward creating a more humanistic environment in dental schools
Woodmansey KF, et al. International volunteer programs for dental students: results of 2009 and 2016 surveys of U.S. dental schools. J Dent Educ 2017;81(2):135-9.	Cultural competence, humanitarianism	Study of U.S. dental schools found increased number of schools providing international experiences for their students and established baseline data to assess future trends
Berge ME, et al. A critical appraisal of holistic teaching and its effects on dental student learning at University of Bergen, Norway. J Dent Educ 2013;77(5):612-20.	Holistic teaching in DE	Literature review; quantitative results did not support hypothesis that holism improved students' satisfaction with teaching
Alcota M, et al. Development of ethical practices and social responsibility in dental education at the University of Chile: student and faculty perceptions. Eur J Dent Educ 2013;17(1):e70-6.	Ethics and professionalism	Study of dental students and faculty found that current dental school curriculum needed to be reviewed
Lantz MS, et al. The status of ethics teaching and learning in U.S. dental schools. J Dent Educ 2011;75(10):1295-309.	Ethics in DE	National (U.S.) study noted 4 needs: integrate ethics across curricula; assess competence; expand faculty development; pay more attention to instruction method
Carreon D, et al. Altruism in dental students. J Health Care Poor Underserved 2011;22(1):56-70.	Altruism	Study found student characteristics were most significant predictors and students with altruistic personalities attended schools where social context was more accepting and respectful of diversity
Brands WG, et al. Professional ethics and cynicism amongst Dutch dental students. Eur J Dent Educ 2011;15(4):205-9.	Ethics and cynicism	Study found graduating students were significantly less cynical than freshmen, but 2/3 were still cynical about dental profession
Markman S. Academic integrity in dental school: a call to action. J Am Coll Dent 2009;76(4):4.	Academic integrity	Commentary
Ozar DT. The future of dental ethics: Part 1. What to hope for and the challenge of getting there. J Am Coll Dent 2008;75(1):25-9.	Ethics in DE	Presentation of 6 ethical skills every dentist should possess; proposed strengthening dental ethics curricula and development of ethics teachers
Hutchins B, Cobb S. When will we be ready for academic integrity? J Dent Educ 2008;72(3):359-63.	Professionalism and ethics in DE	Description of professionalism program and ways to involve faculty in development of professionalism at their institutions
Koerber A, et al. Enhancing ethical behavior: views of students, administrators, and faculty. J Dent Educ 2005;69(2):213-24.	Ethics in DE	Six essays on professional ethics instruction by students, administrators, and faculty at one dental school
Yoshida T, et al. How do U.S. and Canadian dental schools teach interpersonal communication skills? J Dent Educ 2002;66(11):1281-8.	Communication skills in DE	Survey of North American dental schools on their communication skill training
Sharp H, Stefanac SJ. Ethics education in dental school: continuing the conversation. J Dent Educ 2004;68(8):801-2.	Ethics in DE	Comment on article on ethics in DE

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Table 6. Articles about attitudes regarding use of humanities in dental education (DE) (n=40) *(continued)*

Article/First Author, Reference Number	Area of Humanities	Publication Type/Contents
Bertolami, reference 44	Ethics in DE	Identification of weaknesses in a typical ethics curriculum
Welie, reference 43	Ethics in DE	Examination of psychosocial, pedagogical, meta-ethical, and moral implications of faculty roles
Hobdell M, et al. Ethics, equity, and global responsibilities in oral health and disease. Eur J Dent Educ 2002;6(Suppl 3):167-78.	Ethics and global education	Recommendations and goals regarding ethics and global responsibilities in oral health
Odom JG, et al. Revisiting the status of dental ethics instruction. J Dent Educ 2000;64(11):772-4.	Ethics, academic integrity in DE	Survey of faculty responsible for academic integrity found continuing emphasis on dental ethics instruction
Odom JG. Academic and clinical ramifications of integrity and cheating. J Dent Educ 1997;61(8):681-5.	Academic integrity	Proposal of alternative to traditional solutions to academic cheating, with implications for dental students' professionalism
Beemsterboer PL. Academic integrity: what kind of students are we getting, and how do we handle them once we get them? J Dent Educ 1997;61(8):686-8.	Academic integrity	Presentation of data on students' values and behaviors before dental school and discussion of faculty role in prevention and treatment of academic dishonesty
Hershey HG. Professors and professionals: higher education's role in developing ethical dentists. J Am Coll Dent 1994;61(2):29-33.	Ethics in DE	Essay arguing dental educators should aim to produce practitioners who continue to develop as ethical professionals through ongoing learning, experience, and reflection
Blechner BB, et al. The Jay Healey technique: teaching law and ethics to medical and dental students. Am J Law Med 1994;20(4):439-55.	Ethics and law in DE	Presentation of legal and ethical aspects of medical and dental curricula
Ozar DT. The ethical ramifications of cheating. J Dent Educ 1991;55(4):276-81.	Academic integrity	Commentary
Isaac C, et al. Impact of reflective writing assignments on dental students' views of cultural competence and diversity. J Dent Educ 2015;79(3):312-21.	Cultural competence and reflective writing	Study examined linguistic differences in dental students' reflective writing pre and post interviewing an individual culturally different from themselves
Babar MG, et al. An assessment of dental students' empathy levels in Malaysia. Int J Med Educ 2013;4:223.	Empathy in DE	Study used Jefferson Scale of Empathy-Health Care Provider Student version with dental students; construct validity and internal consistency were confirmed
Holtzman JS, Seirawan H. Impact of community-based oral health experiences on dental students' attitudes towards caring for the underserved. J Dent Educ 2009;73(3):303-10.	Cultural competence	Survey of dental students before, during, and after oral health promotion and preventive dental care program for underserved elementary school children
Anderson, reference 73	LBGT issues	Study assessing dental student leaders' perceptions of educational efforts and culture concerning LGBT topics
Formicola A, et al. The dental pipeline program's impact on access disparities and student diversity. J Am Dent Assoc 2009;140:346-5.	Minorities in DE	Description of program for 15 schools; all schools developed courses in cultural competence and public health and increased enrollment of underrepresented minority students
Warman E, et al. Dental students' attitudes toward cheating. J Dent Educ 1994;58(6):402-5.	Academic integrity	Survey of students at a U.S. dental school investigated attitudes about specific cheating behaviors
Turner SP, Beemsterboer PL. Enhancing academic integrity: formulating effective honor codes. J Dent Educ 2003;67(10):1122-9.	Academic integrity	Discussion of elements of an effective and valid honor code and its role in enhancing dental school environment
McCreary CP, Gershen JA. Changes in personality among male and female dental graduates. J Dent Educ 1982;46(5):279-83.	Gender issues in DE	Study assessed personality traits of male and female students and graduates with Comrey personality scales

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Table 6. Articles about attitudes regarding use of humanities in dental education (DE) (n=40) *(continued)*

Article/First Author, Reference Number	Area of Humanities	Publication Type/Contents
Al-Dwairi ZN, Al-Waheidi EM. Cheating behaviors of dental students. J Dent Educ 2004;68(11):1192-5.	Academic integrity	Study of dental students in Jordan found the importance of issue of cheating and how it was evaluated
Hayes-Bautista DE, et al. The rise and fall of the Latino dentist supply in California: implications for dental education. J Dent Educ 2007;71(2):227-34.	Cultural competence, minorities in DE	Demographic survey to identify Latino dentists in California showed a significant decline from 1983 to 2000
Abu Kasim NH, et al. Pairing as an instructional strategy to promote soft skills amongst clinical dental students, Eur J Dent Educ 2014;18(1):51.	Communication skills in DE	Study identified development of soft skills when dental students were paired in clinical training; negative and positive behaviors were reported
Raja S, et al. Patients' perceptions of dehumanization of patients in dental school settings: implications for clinic management and curriculum planning. J Dent Educ 2015;79(10):1201-7.	Empathy in DE	Qualitative study of dental students; participants made suggestions for how oral health professionals can successfully engage patients in treatment
Seymour B, et al. Patient-centered communication: exploring the dentist's role in the era of e-patients and health 2.0. J Dent Educ 2016;80(6):697-704.	Communication skills in DE	Study in which students expressed high interest in learning how to harness modern health communications in clinical care
Broder HL, et al. Communication skills in dental students: new data regarding retention and generalization of training effects. J Dent Educ 2015;79(8):940-8.	Communication skills	Study found a clinical communications program improved students' data-gathering and interpersonal skills; skills were maintained through completion of D4 year
Díaz-Narváez VP, et al. Empathy levels of dental students of Central America and the Caribbean. Health 2015;7(12):1678.	Empathy in DE	Study compared students of 9 faculties using Jefferson Scale of Physicians Empathy; found variability of empathy
Díaz-Narváez VP, et al. Empathy levels of dentistry students in Peru and Argentina. Health 2015;7(10):1268.	Empathy in DE	Study compared students of 2 faculties on levels of empathy; found empathy was able to differentiate populations

Note: Those articles that appear in the references are referred to by last name of first author and reference number; those articles not in the references include full citation.

and formal ethics education in predoctoral dental curricula.[23,24]

Reviewing the relevant literature of almost the past 50 years on humanities in predoctoral dental education, we found that few authors systematically investigated whether humanities in dental curricula had observable impact on the attitudes, competence, and practice of future dentists. In spite of this lack of evidence of long-term impact, many dental educators claimed that the introduction of humanities in predoctoral dental education undoubtedly adds more emphasis on values, ethics, and culture of caring. Conducting research into the effects of any curricular intervention is complicated by a number of methodological obstacles. It is particularly difficult to demonstrate outcomes of a learning activity in the multifaceted areas of the humanities because of the vast plurality of possible confounders.[10] While there is a belief among some dental educators that humanities could lead to the development of imagination, creativity, self-awareness, and empathy for the patients, the answer to the question of whether humanistic education guarantees that students will eventually be exceptional professionals is not yet clear from the literature. Furthermore, clear guidelines for the use of the humanities in future dental curricula have not been identified.[21]

Discussion

From our perspective, predoctoral dental curricula are overwhelmed by biomedical sciences and innovative methods of teaching. The foundation of dental education includes a guiding ethos; still, there is a limited presence of humanities, leading to a potential of losing compassion in the practice of dentistry, due to lack of encouragement and of time for reflection by dental students.[54,55] Humanities,

by providing essential philosophic, developmental, and pedagogical concepts that are necessary to teach students to be interested in the patient as a whole rather than the symptom alone, are very important for the high-quality education of future dentists.[1,56] Trying to define specifically what humanities should accomplish in a dental curriculum, one could come to a conclusion that humanities provide insight into human conditions, illness and suffering, and perception of oneself, as well as into professionalism and responsibilities to self and others, colleagues, and patients.[1] In other words, the use of humanities in predoctoral dental education aims to educate dental students globally, rather than merely teaching them clinical skills.[57]

We found that topics such as mindfulness in dental education are scarcely discussed,[58] while the subject of narrative dentistry has just recently started to be examined as a means to enhance dental students' professionalism and empathy.[59] The relationship between professionalism training in dental education and social media has also been discussed.[60-63] Furthermore, Zahra and Dunton discussed the need for evaluation of art interventions in clinical education and presented a pilot project that aims to integrate humanities, art, craft, and science in dental education.[22]

Recently, Lyon et al.'s study assessed the humanisitic environment that forms the basis of their dental school.[26] These authors recognized "that more varied, robust methods were needed to assess institutional alignment with stated goals for a humanistic learning environment." Patrick expressed the concern that, in dental education, the concepts of professionalism and ethics have been used interchangeably.[64] In addition, the educational environment is important for both faculty and students,[65] and Murdoch-Kinch et al. found that a humanistic environment was said to be important by 97% of faculty members, 95% of staff members, and 94% of students in their dental school.[66] We found numerous publications (n=21) related to academic integrity, among them Karimbux[67] and Koletsi-Kounari.[68] Finally, gender differences in ethics and professionalism of dental students were discussed by You and Bebeau[69] and da Graça Kfouri et al.,[70] while LBGT issues in dental education were researched in three studies.[71-73] These and other articles we examined reinforced Osler's caution to physicians to "care more particularly for the individual patient than for the special features of the disease."[74]

Limitations of our research were that the screening of articles (in both the primary and secondary review) was performed by two of the authors (K.M. and A.I.M.), but the categorization of resulting articles was performed by one of the authors (K.M.). Another limitation is that only publications in the English literature were included in our review.

Conclusion

Dentists must be educated to see, hear, and understand their patients. Therefore, there is always a need for education in the humanities in dental education. Future dentists need to be educated appropriately to develop abilities not only to interpret data through analytical and synthetic reasoning, but also to carefully observe the patient and hear his or her language. Humanities can help future dental professionals develop empathy for their patients, constructing personal and professional values based on sound foundations. Our review found that limited studies provide evidence of the impact of humanities on dentists and their competence to treat patients holistically, leaving many questions that need to be further studied.

Disclosure

The authors reported no conflicts of interest.

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