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Keywords:	compassion training, empathy, MEDICAL EDUCATION & TRAINING, systematic review

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For Submission to *BMJ Open*

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Abstract

Introduction: Compassionate patient care has been associated with improved clinical outcomes for patients. However, current evidence suggests that healthcare is experiencing a compassion crisis, with physicians frequently overlooking opportunities to treat patients with compassion. Although there is evidence that compassionate care can be enhanced through training interventions, it is currently unclear what specific skills and behaviors ought to be taught and how best to transfer this information to the learner. The objectives of this systematic review are to collate the world's literature on compassion training to determine (1) the specific skills and behaviors that should be taught (curriculum), and (2) the methods of training that are most effective at improving compassionate patient care.

Methods and analysis: We will perform a qualitative systematic review of studies aimed at improving compassionate patient care among physicians and physicians in training. We will comprehensively search CENTRAL, MEDLINE, EMBASE, and CINAHL. Additional recommended techniques for systematic reviews of complex evidence will be performed including pursuing selected "references of references", electronic citation tracking, and consulting experts in the field. Two investigators will independently review all search results. After identification and inclusion of papers, we will use a standardized form for data extraction. We will use tables to describe the study populations, interventions tested (including specific skill/behaviors taught and training methods utilized), outcome measures, and effects of interventions on outcome measures compared to control groups. Where appropriate, meta-analysis will be used for quantitative analysis of the data.

Ethics and dissemination: The proposed systematic review does not require ethical approval since no individual patient level data will be collected. Results of this study will contribute to the understanding of compassion training and help inform the development of compassion training curricula.

Registration: PROSPERO international prospective register of systematic reviews: CRD42018095040.

Word count: 300

Keywords: compassion training, empathy, education, systematic review

Strengths:

- This protocol design is focused on identifying the specific skills/behaviors that should be taught to enhance compassion, and the training methods that are most effective at improving compassionate patient care, as opposed to only determining if compassion training has an effect.
- This protocol design is consistent with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Protocols (PRISMA-P) statement, as well as the Cochrane handbook for systematic reviews of interventions.

Limitations:

- It is unlikely that it will be possible to pool data given the likely heterogeneity in both interventions and outcome measures.

Introduction

There is currently evidence to suggest that healthcare is experiencing a compassion crisis -- an absence of (or inconsistency in) compassionate patient care.[1] Providing compassionate, patient-centered care is associated with improved clinical outcomes for patients, and alternatively the absence of compassionate care is associated with poor quality of care and increased risk of harm to patients through medical errors.[2] In addition, compassionate patient care has been associated with decreased healthcare provider burnout and improved well-being,[3] as well as lower healthcare costs (i.e. better patient communication resulting in reduced diagnostic test expenditures).[4] Despite the overwhelming biomedical literature demonstrating the importance of compassionate patient care, physicians frequently overlook opportunities to be compassionate, focusing instead on narrow biomedical inquiry and explanations.[5]

Both the Association of American Medical Colleges and the American Medical Association underscore the importance of compassionate patient care.[6 7] It is reasonable to postulate that medical training is an ideal time to implement compassion training in an effort to help future physicians develop the skills required to care for patients in a compassionate manner. However, compassion training is not a primary focus during medical training, and studies have demonstrated that empathy declines during both medical school and residency training.[8 9] Thus, there is an urgent need to develop compassion training curricula, which can be implemented during medical training, as well as help inform currently practicing physicians. Previous reviews have demonstrated that healthcare provider compassion can be enhanced through training interventions.[7 10 11] However, there is currently a paucity of data on what specific skills and behaviors ought to be taught (i.e. the curriculum) and how best to transfer this information to the learner.

The objectives of this systematic review are to collate the world's literature on compassion training to determine (1) the specific skills and behaviors that should be taught, and (2) the methods of training that are most effective at improving compassionate patient care. We hypothesize that a combination of specific skills (e.g. identifying compassion opportunities) and behaviors (both verbal and non-verbal communication) taught through experiential learning will be most effective at enhancing compassionate patient care by physicians and physicians-in-training.

Methods and analysis

Protocol and registration

This systematic review protocol is prepared in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Protocols (PRISMA-P) statement (**Supplemental Material 1**),[12] as well as the Cochrane handbook for systematic reviews of interventions.[13] The final results will be reported according to PRISMA and the Meta-analysis of Observational Studies in Epidemiology (MOOSE) guidelines.[14 15] This systematic review has been registered in the PROSPERO international prospective register of systematic reviews (registration number CRD42018095040).

Search for and identification of studies

An electronic search will include databases generally considered to be the most important sources to search:[13] CENTRAL, MEDLINE, EMBASE, and CINAHL. The fully reproducible search strategy is provided in **Supplemental Material 2**. These strategies were established using a combination of standardized terms and key words, and expanded upon a previously published systematic review examining if training interventions can improve empathy.[7] In addition, we will perform the following recommended techniques for systematic reviews of complex evidence: pursuing selected “references of references” (i.e. also termed “snowballing”), electronic citation tracking, and consulting experts in the field.[16]

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We will include all clinical studies of interventions aimed at enhancing compassion/empathy among medical students, residents, and/or physicians. In order to be included all studies must contain: (1) an intervention arm in which subjects clearly underwent an intervention aimed at enhancing compassion/empathy; (2) a clearly defined control arm in which subjects did not receive the intervention (e.g. wait-list, before/after, standard training); (3) the intervention was

tested on medical students, residents, and/or physicians; and (4) an outcome measure assessing the effect of the intervention on self-reported and/or other-reported outcome measures of empathy or compassion. We will consider studies eligible for review regardless of language or publication type. We will exclude studies that are secondary reports of previously published studies. We also will exclude papers that are reviews, correspondence, or editorials; however, we will screen the reference lists of review articles to identify further studies for inclusion.

Study selection and data abstraction

Two members of the research team will independently screen the titles and abstracts of identified studies for potential eligibility. After the relevance screen, exclusion logs will be compared between the two reviewers in order to determine whether there is disagreement and the Kappa statistic will be used to quantify the inter-observer agreement. In cases of disagreement, the full manuscript will be reviewed for inclusion. All studies deemed potentially relevant will be obtained and the full manuscripts will be reviewed for inclusion. Two reviewers will independently abstract data on all study populations, interventions tested, outcome measures, and effect of interventions on outcome measures compared to control groups, using a standardized data collection form. Any disagreements in these processes will be resolved by consensus with a third reviewer.

Assessment of study bias

For each included study, the risk of bias will be assessed using the Cochrane Collaboration's tool for assessing the risk of bias in clinical trials. This tool evaluates six domains: selection, performance, detection, attrition, reporting, and other biases.[13]

Analysis

We will perform a primarily qualitative analysis of the data in accordance with the recommended methodology for qualitative reviews published in the Cochrane Handbook.[13] We will collate and summarize studies in table format, stratified by individual publication. We will table: (1) population sampled (i.e. medical student, resident, attending physician); (2) specific skills (e.g. identifying compassionate opportunities) and behaviors taught during the intervention [behaviors will be further delineated as verbal (e.g. compassionate statements) and non-verbal (e.g. eye contact, facial expression)]; (3) training methods utilized (i.e. lecture, video/audio training, small groups sessions, simulated experiential learning, real experiential learning, reflective exercises, and other); (4) outcome measures, including primary and all secondary outcomes; and (5) effect of intervention on outcome measures compared to control groups.

After conducting the systematic review if it is determined that the data can be pooled, we will perform meta-analyses using random effects models to calculate overall effect sizes (with 95% confidence intervals) between intervention and control groups for each outcome that can be objectively analyzed. The I^2 statistic will be used to assess heterogeneity between studies. The following thresholds will be used for the I^2 statistic: low (25-49%), moderate (50-74%), and high (≥75%) values.[17] For pooled data, publication bias will be assessed using funnel plots (graphical display of the size of the treatment effect against the precision of the trial) for each analyzed outcome.

Protocol amendments

Any amendments to this protocol will be described along with the rationale and date the change was implemented.

Ethics and dissemination

This is a systematic review of completed studies and thus no ethical approval will be required. The results from this systematic review will be submitted for publication to peer-reviewed journals, and to national meetings in presentation form. We anticipate that this study will identify specific skills/behaviors and training methods that are most effective at improving compassionate patient care. The results from this study will be used to inform the development of compassionate training curriculums.

Discussion

There has been increasing evidence that compassionate patient care is lacking across healthcare systems. In addition to compassionate care being the "right" thing to do out of respect for the patient, it also has been demonstrated to be associated with positive outcomes for patients (e.g. improved clinical outcomes), healthcare providers (e.g. reduced burnout), and healthcare systems (e.g. lower costs).[1] Thus, the current state of inadequate compassionate patient care is a significant public health issue. Although it has previously been demonstrated that training interventions can enhance compassionate care,[7] it is currently unknown what specific skills and behaviors ought to be taught and how best to transfer this information to the learner.

This systematic review will collate the world's literature on compassion training for medical students, residents, and physicians. We will tabulate the effects of teaching specific skills/behaviors on outcome measures of compassion/empathy, as well as identify which methods of training best transfer this information. Specifically, we expect to identify (1) what specific skills and behaviors need to be taught and (2) how best to teach them, based on the current literature.

In conclusion, results of this study will contribute to the understanding of compassion training and help inform the development of compassion training curricula, which can be implemented during medical training, as well as for currently practicing physicians. In addition, it will identify important knowledge gaps in the literature and help guide future research of compassion training.

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Author's contributions

All authors have made substantial contributions to this paper. BWR supervised all aspects of the study design and takes responsibility for the paper as a whole. All authors contributed to the development of the selection criteria, the risk of bias assessment strategy, and data extraction criteria. MBR, ST, and BWR developed the search strategy. BWR provided statistical expertise. SP and BWR drafted the manuscript. All authors read and contributed substantially to revision of the final manuscript. All authors approved the manuscript in its final form.

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Competing interest statement

None of the authors have potential financial conflicts of interest to disclose.

PRISMA-P 2015 Checklist

This checklist has been adapted for use with protocol submissions to *Systematic Reviews* from Table 3 in Moher D et al: Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Systematic Reviews* 2015 **4**:1

Section/topic	#	Checklist item	Information reported		Line number(s)
			Yes	No	
ADMINISTRATIVE INFORMATION					
Title					
Identification	1a	Identify the report as a protocol of a systematic review	☒	☐	title page
Update	1b	If the protocol is for an update of a previous systematic review, identify as such	☐	☒	N/A
Registration	2	If registered, provide the name of the registry (e.g., PROSPERO) and registration number in the Abstract	☒	☐	page 3
Authors					
Contact	3a	Provide name, institutional affiliation, and e-mail address of all protocol authors; provide physical mailing address of corresponding author	☒	☐	title page
Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review	☒	☐	page 13
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments	☐	☒	N/A
Support					
Sources	5a	Indicate sources of financial or other support for the review	☒	☐	page 13
Sponsor	5b	Provide name for the review funder and/or sponsor	☐	☒	N/A
Role of sponsor/funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol	☐	☒	N/A
INTRODUCTION					
Rationale	6	Describe the rationale for the review in the context of what is already known	☒	☐	page 4
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to	☒	☐	pages 4-5

Section/topic	#	Checklist item	Information reported		Line number(s)
			Yes	No	
		participants, interventions, comparators, and outcomes (PICO)			
METHODS					
Eligibility criteria	8	Specify the study characteristics (e.g., PICO, study design, setting, time frame) and report characteristics (e.g., years considered, language, publication status) to be used as criteria for eligibility for the review	☒	☐	pages 6-7
Information sources	9	Describe all intended information sources (e.g., electronic databases, contact with study authors, trial registers, or other grey literature sources) with planned dates of coverage	☒	☐	page 6
Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	☒	☐	supplemental material
STUDY RECORDS					
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	☒	☐	page 7
Selection process	11b	State the process that will be used for selecting studies (e.g., two independent reviewers) through each phase of the review (i.e., screening, eligibility, and inclusion in meta-analysis)	☒	☐	page 7
Data collection process	11c	Describe planned method of extracting data from reports (e.g., piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	☒	☐	page 7
Data items	12	List and define all variables for which data will be sought (e.g., PICO items, funding sources), any pre-planned data assumptions and simplifications	☒	☐	pages 7-8
Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	☒	☐	page 8
Risk of bias in individual studies	14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	☒	☐	page 7
DATA					
Synthesis	15a	Describe criteria under which study data will be quantitatively synthesized	☒	☐	page 8
	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data, and methods of combining data from studies, including any planned exploration of consistency (e.g., I^2, Kendall's tau)	☒	☐	page 8
	15c	Describe any proposed additional analyses (e.g., sensitivity or subgroup analyses, meta-	☐	☒	N/A

Section/topic	#	Checklist item	Information reported		Line number(s)
			Yes	No	
		regression)			
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned	☒	☐	page 8
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (e.g., publication bias across studies, selective reporting within studies)	☒	☐	page 8
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (e.g., GRADE)	☐	☒	N/A

Supplemental Material 2: Systematic review search design.

#1: compassion* OR empath* OR caring

#2: "medical student" OR resident OR physician

#3: educat* or "clinical competence" or training or workshop

#4. #1 AND #2 AND #3

#5. animals [mh] NOT humans [mh]

#6. Case reports [pt]

#7. #5 OR #6

#8. #4 NOT #7

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Study selection and data abstraction

Two members of the research team will independently screen the titles and abstracts of identified studies for potential eligibility. After the relevance screen, exclusion logs will be compared between the two reviewers in order to determine whether there is disagreement and the Kappa statistic will be used to quantify the inter-observer agreement. In cases of disagreement, the full manuscript will be reviewed for inclusion. All studies deemed potentially relevant will be obtained and the full manuscripts will be reviewed for inclusion. Two reviewers will independently abstract data on all study populations, interventions tested, outcome measures, and effect of interventions on outcome measures compared to control groups, using a standardized data collection form. Any disagreements in these processes will be resolved by consensus with a third reviewer.

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Protocol amendments

Any amendments to this protocol will be described along with the rationale and date the change was implemented.

Patient and Public Involvement

Our study designed was informed by the fact that previous research has demonstrated that compassionate care is considered by patients to be one of the most important aspects of high quality healthcare.[18] Patients were not involved in the actual design of this study. Given this is a systematic review patients will not be enrolled in this study.

Ethics and dissemination

This is a systematic review of completed studies and thus no ethical approval will be required. The results from this systematic review will be submitted for publication to peer-reviewed journals, and to national meetings in presentation form. We anticipate that this study will identify specific skills/behaviors and training methods that are most effective at improving compassionate patient care. The results from this study will be used to inform the development of compassionate training curriculums.

Discussion

There has been increasing evidence that compassionate patient care is lacking across healthcare systems. In addition to compassionate care being the "right" thing to do out of respect for the patient, it also has been demonstrated to be associated with positive outcomes for patients (e.g. improved clinical outcomes), healthcare providers (e.g. reduced burnout), and healthcare systems (e.g. lower costs).[1] Thus, the current state of inadequate compassionate patient care is a significant public health issue. Although it has previously been demonstrated that training interventions can enhance compassionate care,[7] it is currently unknown what specific skills and behaviors ought to be taught and how best to transfer this information to the learner.

This systematic review will collate the world's literature on compassion training for medical students, residents, and physicians. We will tabulate the effects of teaching specific skills/behaviors on outcome measures of compassion/empathy, as well as identify which methods of training best transfer this information. Specifically, we expect to identify (1) what specific skills and behaviors need to be taught and (2) how best to teach them, based on the current literature.

In conclusion, results of this study will contribute to the understanding of compassion training and help inform the development of compassion training curricula, which can be implemented during medical training, as well as for currently practicing physicians. In addition, it will identify important knowledge gaps in the literature and help guide future research of compassion training.

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Author's contributions

All authors have made substantial contributions to this paper. BWR supervised all aspects of the study design and takes responsibility for the paper as a whole. SP, APB, SS, MBR, HK, ST, and BWR contributed to the development of the selection criteria, the risk of bias assessment strategy, and data extraction criteria. MBR, ST, and BWR developed the search strategy. BWR provided statistical expertise. SP and BWR drafted the manuscript. SP, APB, SS, MBR, HK, ST, and BWR read and contributed substantially to revision of the final manuscript. All authors approved the manuscript in its final form.

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Competing interest statement

None of the authors have potential financial conflicts of interest to disclose.

PRISMA-P 2015 Checklist

This checklist has been adapted for use with protocol submissions to *Systematic Reviews* from Table 3 in Moher D et al: Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Systematic Reviews* 2015 **4**:1

Section/topic	#	Checklist item	Information reported		Line number(s)
			Yes	No	
ADMINISTRATIVE INFORMATION					
Title					
Identification	1a	Identify the report as a protocol of a systematic review	☒	☐	title page
Update	1b	If the protocol is for an update of a previous systematic review, identify as such	☐	☒	N/A
Registration	2	If registered, provide the name of the registry (e.g., PROSPERO) and registration number in the Abstract	☒	☐	page 3
Authors					
Contact	3a	Provide name, institutional affiliation, and e-mail address of all protocol authors; provide physical mailing address of corresponding author	☒	☐	title page
Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review	☒	☐	page 13
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments	☐	☒	N/A
Support					
Sources	5a	Indicate sources of financial or other support for the review	☒	☐	page 13
Sponsor	5b	Provide name for the review funder and/or sponsor	☐	☒	N/A
Role of sponsor/funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol	☐	☒	N/A
INTRODUCTION					
Rationale	6	Describe the rationale for the review in the context of what is already known	☒	☐	page 4
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	☒	☐	pages 4-5

Section/topic	#	Checklist item	Information reported		Line number(s)
			Yes	No	
METHODS					
Eligibility criteria	8	Specify the study characteristics (e.g., PICO, study design, setting, time frame) and report characteristics (e.g., years considered, language, publication status) to be used as criteria for eligibility for the review	☒	☐	pages 6-7
Information sources	9	Describe all intended information sources (e.g., electronic databases, contact with study authors, trial registers, or other grey literature sources) with planned dates of coverage	☒	☐	page 6
Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	☒	☐	supplemental material
STUDY RECORDS					
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	☒	☐	page 7
Selection process	11b	State the process that will be used for selecting studies (e.g., two independent reviewers) through each phase of the review (i.e., screening, eligibility, and inclusion in meta-analysis)	☒	☐	page 7
Data collection process	11c	Describe planned method of extracting data from reports (e.g., piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	☒	☐	page 7
Data items	12	List and define all variables for which data will be sought (e.g., PICO items, funding sources), any pre-planned data assumptions and simplifications	☒	☐	pages 7-8
Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	☒	☐	page 8
Risk of bias in individual studies	14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	☒	☐	page 7
DATA					
Synthesis	15a	Describe criteria under which study data will be quantitatively synthesized	☒	☐	page 8
	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data, and methods of combining data from studies, including any planned exploration of consistency (e.g., I^2, Kendall's tau)	☒	☐	page 8
	15c	Describe any proposed additional analyses (e.g., sensitivity or subgroup analyses, meta-regression)	☐	☒	N/A
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned	☒	☐	page 8
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (e.g., publication bias across studies, selective	☒	☐	page 8

Section/topic	#	Checklist item	Information reported		Line number(s)
			Yes	No	
		reporting within studies)			
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (e.g., GRADE)	☐	☒	N/A

Supplemental Material 2: Systematic review search design.

#1: compassion* OR empath* OR caring

#2: "medical student" OR resident OR physician

#3: educat* or "clinical competence" or training or workshop

#4. #1 AND #2 AND #3

#5. animals [mh] NOT humans [mh]

#6. Case reports [pt]

#7. #5 OR #6

#8. #4 NOT #7