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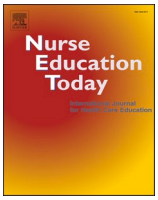

Use and effectiveness of the arts for enhancing healthcare students' empathy skills: A mixed methods systematic review

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ABSTRACT

Objective: To identify, critically appraise and synthesise evidence of the use and effectiveness of the arts for enhancing pre-registration/prelicensure healthcare students' empathy skills.
Design: A systematic review of mixed methods literature.
Data sources: A search of six electronic databases was conducted.
Review methods: Articles describing English language, peer-reviewed, primary research studies reporting empathy as an outcome of an arts-based intervention with pre-registration/prelicensure healthcare students (years 1–7) and published between 2000 and 2024 were eligible for inclusion. The JBI Manual for Evidence Synthesis guided the review and a convergent segregated methodology was used to synthesise the results. Methodological rigour of included studies was examined using the Mixed Methods Appraisal Tool.
Results: Twenty studies from 12 countries described the use of the arts to develop empathy, with visual arts being the most common approach (n = 8). Other modalities included film, drama, digital stories, literature, creative writing, music, poetry, photography and dance. Studies included nursing, medicine and dental, pharmacy and/or health sciences students. Ten studies used quantitative methods, three qualitative, and seven used mixed methods designs. Of the studies that presented pre-post outcome measures, nine reported significant gains in empathy scores at post-test and two reported non-significant gains in empathy. In eight studies, empathy scores demonstrated a significant intervention effect with effect sizes ranging from moderate ($d = 0.52$) to large ($d = 1.19$). Findings from qualitative studies revealed that arts pedagogies support students to better understand the perspectives of people with a lived experience of suffering but that these approaches are sometimes perceived negatively by students.
Conclusions: Arts interventions generally have a positive effect on healthcare students' empathy levels and enable a nuanced conceptual understanding of empathy. Arts modalities used as a stimulus for active learning and supported with facilitated group-based discussion and/or reflection, tend to be most effective.

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1. Introduction

An expanding body of research has demonstrated the positive impact of empathic healthcare interactions on people's physical and psychological wellbeing (Trzeciak and Mazzarelli, 2019). Although studies attest to the importance of empathy as a professional attribute for healthcare professionals, there is also evidence that, in medical and nursing students in particular, empathy levels too often decline during the period of enrolment in an undergraduate degree (Hong et al., 2012; Ward et al., 2012). In medical programs, this has been attributed to a range of factors, including the demands of caring for increasingly complex patients, poor role models and stressful workloads (Howick et al., 2023). Mutabazi et al. (2018) also hypothesised that declining empathy levels in nursing students could be attributed to the increasing use of self-directed, online and simulated learning experiences. To address these concerns, educators are increasingly implementing interventions designed to enhance students' empathy skills. Although the positive impact of experiential learning activities has been demonstrated (Bearman et al., 2015), much less attention has been given to the arts as an educational strategy for teaching empathy. To address this gap, we conducted a systematic mixed methods review to examine the use and effectiveness of the arts for enhancing healthcare students' empathy skills.

2. Background

Empathy is a multidimensional construct with various definitions of the term evident in contemporary healthcare literature. For example, Hatfield et al. (2011) suggested that empathy includes the cognitive ability to understand another person's feelings, an emotional resonance with those feelings, and the altruistic motivation to respond to the person's needs. Similarly, a conceptual model developed by Levett-Jones and Cant (2020), titled the Empathy Continuum, theorised that there are three stages of an empathic interaction: Perceiving, Processing and Responding to others, indicating that empathy involves cognitive, affective, communicative, and behavioural aspects.

Empathy is a basic component of therapeutic relationships and integral to quality patient care (Hojat et al., 2013; Trzeciak and Mazzarelli, 2019). Consequently, teaching students how to establish and maintain empathic relationships is increasingly viewed as an important component of health professional education. To this end, a body of literature has described a range of educational approaches for teaching empathy, from traditional classroom-based activities to immersive simulations (Bearman et al., 2015; Levett-Jones et al., 2019; Palmer et al., 2020). However, the findings from these studies indicate variability in approaches and outcomes. For example, Palmer et al. (2020), who reviewed 18 studies in the healthcare professions, found that two-thirds of evaluations showed significant gains in empathy post training, although concerns were raised about inconsistencies in training length and the inadequacy of underlying pedagogies. In the nursing field, a review and meta-analysis of 18 studies found evidence of a significant improvement in empathy levels pre-post intervention (Teding van Berkhout and Malouff, 2016). Whereas, another review of the effectiveness of empathy interventions in nursing showed mixed results, with only 9 of 23 studies demonstrating practical improvements in empathy (Levett-Jones et al., 2019), with the most effective approaches shown to be immersive simulation-based interventions.

Although not used to the same extent as simulations, arts-based pedagogies are also being incorporated into healthcare education with the aim of enhancing students' empathy skills (Levett-Jones and Cant, 2020). The arts encompass visual, literary and performing arts, with visual arts referring to drawing, film, painting, photography and sculpting; literary arts described as fiction, drama and poetry; and performing arts including theatre, dance and music (Cambridge English Dictionary, 2023) (see Fig. 1).

The arts play an important role in society, shaping cultures, documenting history, telling stories and communicating emotions in ways that often transcend language (Clover, 2006). Reiss (2018) suggests that the arts impact brain activity, creativity and imagination, which shifts people from self-preoccupation to appreciation of another person's lived experience. When an artwork resonates with an individual it creates more than an emotional response, the person is moved to 'consider a different perspective … and a shared emotional experience that unifies our humanity with those who are both like and unlike ourselves' (Reiss, 2018, p. 145).

The arts have unique qualities that help to engage learners, foster learning and create new meanings (Haidet et al., 2016), and as Einstein noted 'arts and sciences are branches from the same tree' (Einstein, 2005, p. 7). This holistic view of the importance of integrating art and science is evident in the history of higher education, beginning with Socrates and Aristotle, and continuing to the present day. However, over time curricula have tended to become fragmented along disciplinary lines. This is particularly apparent in science, technology, engineering, mathematics, and medicine (STEMM) courses (Bear and Skorton, 2018). Yet, in a number of medical programs, there is a strong tradition of integrating humanities and arts with the sciences and a recognition that this holistic approach leads to improved educational and career outcomes for both undergraduate and graduate students (Dalia et al., 2020).

While a number of reviews have focused on the impact of the arts on health and wellbeing (Fancourt and Finn, 2019), few recent studies have explored the impact of the arts on the development of empathy in healthcare students. Those that have, tend to use either quantitative or qualitative studies; single disciplines such as medicine (Batt-Rawden et al., 2013a, 2013b) or nursing (Rieger et al., 2016); or specific arts modalities such as reflective writing (Chen and Forbes, 2014) or drama (Jefferies et al., 2021). Reviews have seldom examined the impact of different arts modalities on the empathy of healthcare students from different disciplines. This confirms the need to conduct the current mixed methods review.

3. Objective

The objective of this mixed methods systematic review was to identify, critically appraise and synthesise evidence of the use and effectiveness of the arts for enhancing healthcare students' empathy skills.

4. Methods

This review was informed by the JBI Manual for Evidence Synthesis (Aromataris and Munn, 2020) and reporting conducted with reference to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Page et al., 2021). Studies that used quantitative, qualitative and mixed methods designs were included. The research questions addressed in the review were:

(i) How have arts interventions been used to enhance healthcare students' empathy skills?
(ii) How effective is use of the arts as a strategy to enhance healthcare students' empathy skills?

4.1. Eligibility criteria

Eligibility criteria (see Table 1) were established by the research team. Included studies were peer-reviewed, primary research studies that reported empathy as an outcome of an arts-based intervention with pre-registration/prelicensure students enrolled in any year of a healthcare degree.

4.2. Search strategy

A three-stage search strategy guided by the university librarian was used, with an initial search conducted in Google Scholar to explore keywords and the breadth of published literature. Six databases were then searched for relevant studies: CinahlComplete; ERIC, Medline, PubMed, PsycInfo, and Scopus. The search strategy used MeSH terms and keywords based on PICO: 'Population' (student, health occupations OR 'student, nursing' OR 'student, medicine' OR 'student, dental'), Intervention ('arts education' OR 'arts' OR 'visual arts' OR 'painting' OR 'sculpture' OR 'literature' OR 'cinema' OR 'music' OR 'theatre') AND Comparison ('usual education/teaching') AND (Outcome) ('empathy development'). These terms were varied as required and by 'smart words' suggested in the different databases. In addition, the reference lists of included papers were hand searched for eligible articles. All identified study titles and abstracts were downloaded to the electronic database EndNote™ (2020). The search was first conducted in 2022 and then updated in 2024.

4.3. Selection process

The study identification and selection processes are presented in a PRISMA flowchart (Fig. 2).

A total of 1560 papers were identified from the data base search. After removing 253 duplicate papers, 1307 articles remained. Preliminary filtering to remove papers with the wrong sample (children, school-teachers, physicians), non-arts-based interventions, and empathy not being reported as a research outcome, left 63 records for screening.

Table 1
Eligibility criteria.

Eligible studies	Ineligible studies
• Peer reviewed quantitative, qualitative and mixed methods designs that reported Arts-based empathy educational interventions and reported empathy as a research outcome measure. • English language studies published between the year 2000 and February 2024. • Studies that included pre-registration healthcare students – such as medical, nursing and allied health disciplines.	• Cross-sectional surveys measuring empathy levels of student cohorts but without reference to Arts based interventions. • Studies describing theoretical or pedagogical approaches without evaluative research data. • Studies of qualified healthcare professionals or individuals who were not healthcare students. • Editorials, dissertations, unpublished or grey literature.

Using Covidence™ (2022), three researchers (TLJ, JR, RC) independently assessed titles and abstracts against the study inclusion criteria. Where there was any doubt about inclusion, the full text papers were read and agreement was reached after discussion. No further articles were identified from hand searching of reference lists, leaving a total of 20 papers for inclusion in the final review.

4.4. Methodology

The characteristics and results from each included article were tabulated across six criteria: country, design/aim; arts intervention; discipline/sample; instrument/analysis; key results; and limitations (Table 2).

Fig. 1. Examples of arts strategies.
Source: https://wp-venus.s3.eu-west-1.amazonaws.com/wp-content/uploads/sites/2/2012/01/146746188.jpg.

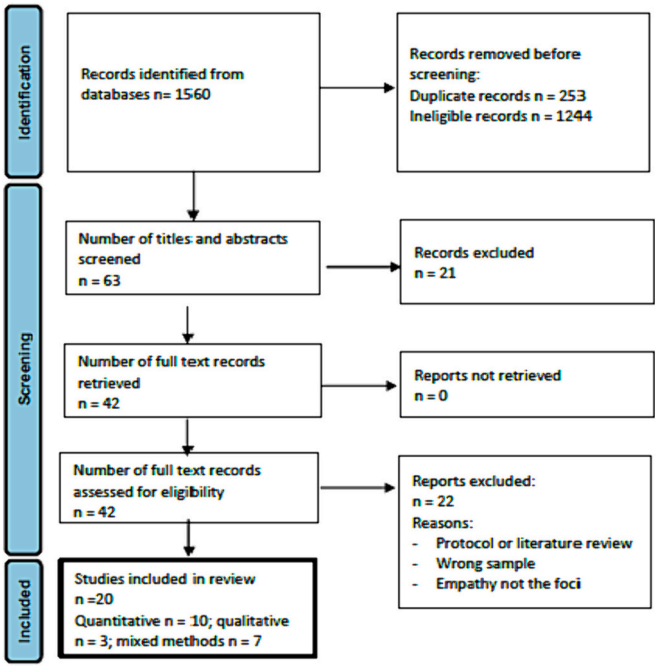

Fig. 2. Preferred reporting items for systematic review and meta-analyses (PRISMA) flow diagram.

Guided by the JBI Manual for Evidence Synthesis a convergent segregated methodology was used to synthesise the review results (Aromataris and Munn, 2020). This involved synthesis of quantitative data and qualitative data separately. Although we aimed to synthesise quantitative data in the form of a meta-analysis, this was not possible. Consequently, a narrative summary was undertaken. Qualitative data was pooled and key findings summarised. The results from the quantitative and qualitative data were integrated to form the discussion.

4.5. Quality appraisal

Once the three authors had verified the papers to be included, the other co-authors conducted quality assessments of each article using the Mixed Methods Appraisal Tool (MMAT) (Pluye and Hong, 2014). This instrument has been found valid for assessing the quality of studies in mixed methods systematic reviews (Souto et al., 2015). Assessment was based on sets of questions for each of the various study designs, with a response scale of Yes/No/Unsure.

The quality assessment scores are included in Table 2. While most scores were high, indicated by a score of >3* (60 % or more quality criteria being met), McGarry and Aubeeluck (2013) was assessed as 2* (scoring <40 %.) This study was nevertheless included as it was deemed that it met the inclusion criteria and added information of value to the review.

5. Results

The 20 included papers were representative of 12 geographical locations including North America (Canada and the United States), Europe (Sweden, Spain and United Kingdom), the Middle East (Israel, Iran, Turkey), and Asia (Malaysia, Hong Kong, China, Korea). Studies spanned the last two decades, although 11 were published within the last six years.

5.1. Participants

Most of the papers described studies in which nursing students (n = 11) or medical students (n = 5) were the participants. Dental, pharmacy or health sciences students comprised the sample groups in three papers and one paper referred to an interdisciplinary participant group comprised of nursing, medical and pharmacy students. Students were enrolled mainly in years one to five of their respective programs, with one cohort (Ahmadzadeh et al., 2019) enrolled in year seven. With the exception of Zazulak et al.'s (2015) study which was conducted at the McMaster Museum of Art, all of the studies were undertaken in a university/college setting. No studies were conducted in a clinical context.

5.2. Arts interventions

A range of arts interventions were described, with visual arts being the most common (n = 8) (Ahmad et al., 2020; Bentwich and Gilbey, 2017; Leyva-Moral et al., 2021; Potash and Chen, 2014; Potash et al., 2014; Wikström, 2001, 2003; Zazulak et al., 2015). In these studies, photographic, contemporary and classical works of art were used as a stimulus for group-based discussions and reflection. An innovative visual literacy program with health sciences students conducted at the McMaster Museum of Art was described by Zazulak et al. (2015).

The use of film (The Doctor and Wit) to enhance empathy levels was referred to in two papers (Ahmadzadeh et al., 2019; Briggs and Abell, 2012), drama (role plays, improvisation and psychodrama) in three papers (Bas-Sarmiento et al., 2017; Ozcan et al., 2011; Zelenski et al., 2020), and digital stories in two papers (Petty, 2021; Yu et al., 2021). The use of literature (fiction reading) was described by Collins et al. (2017) and creative writing by Laughey et al. (2021). Lastly, the use of a combination of arts interventions such as film, literature, visual arts, music, drama, poetry, photography and dance were discussed in three of the papers (Jensen and Curtis, 2008; McGarry and Aubeeluck, 2013; Yang et al., 2018).

5.3. Study designs

Of the 20 included studies, three were qualitative, ten quantitative, and seven used mixed methods designs. It should be noted that a number of papers that referred to qualitative data were excluded during the screening process as they described quality projects and subject evaluations rather than research projects with a rigorous methodology and empathy as an outcome.

5.4. Qualitative study findings

Qualitative data was reported in two qualitative descriptive studies (Jensen and Curtis, 2008; Wikström, 2001) and one that used a social constructivist approach (Laughey et al., 2021). There was some qualitative data evident in the seven mixed-methods papers, however this was mostly limited to open-ended responses about the value of the learning experience. Overall, the key finding from the qualitative data in the included studies was that the arts interventions support students to better understand the perspectives and feel more empathy towards people with a lived experience of suffering, such as mental illness (Jensen and Curtis, 2008), learning disability (McGarry and Aubeeluck, 2013); homelessness (Ahmad et al., 2020) and HIV (Leyva-Moral et al., 2021). Two studies also explored the impact of an arts intervention on learners' understanding of and empathy towards people who were dying (Briggs and Abell, 2012; Wikström, 2001).

The second key finding to emerge from the qualitative data related to teaching and learning considerations when using the arts to enhance learners' empathy skills. The findings revealed that not all students are supportive of art initiatives (McGarry and Aubeeluck, 2013) and that they sometimes feel compelled to 'fake' empathy (Laughey et al., 2021). It was also identified that students can perceive a degree of hypocrisy when their role models do not emulate empathic practice (Laughey et al., 2021).

Table 2
Characteristics of included studies by modality with effectiveness outcomes (n = 20).

Author/ country/ quality score	Design, aim	Intervention	Discipline/sample	Instrument/analysis	Key results	Conclusion and limitations
Visual arts						
Ahmad et al., 2020 Malaysia MMAT: 5	**Design:** Mixed methods study to investigate the effectiveness of a visual arts photo dentistry intervention. **Aim**: To improve dental students' empathy scores and learning about the provision of comprehensive patient care.	**Visual arts:** The photo-dentistry learning activity was developed by specialists from the areas of dentistry, arts, education, and psychology. Working in pairs, students were required to interpret a photograph that portrayed an individual who required specialised dental care (e.g. a homeless person) using three guided questions and to then present their findings to the class.	4th year undergraduate dental students (n = 69). Response rate: 100 %.	Toronto Empathy Questionnaire (TEQ) completed pre and post intervention. Qualitative survey with two questions: 'What did you learn from this activity' and 'How would this activity change the way you manage patients in the future'. Quantitative data were analysed using via paired *t*-tests. Qualitative data were thematically analysed.	A significant pre-post increase was seen in TEQ total mean paired t-test scores - Pretest: M = 46.67 (SD 5.63) posttest: M = 49.83 (SD 6.99). Mean difference ⁻3.16 (P < 0.001, 95 % CI: 4.2-⁻2.1) **Effect:** Moderate-*d* = 0.43, *r* = 0.21 effect size correlation **Emergent themes:** 1. Improved understanding of the need for comprehensive care for compromised patients; 2. Improved observational and critical thinking skills; 3. Improved attitudes and empathy towards patients.	The photo-dentistry intervention was an effective approach for improving dental students' empathy scores and their learning about the provision of comprehensive patient care. **Limitations:** The study measured only immediate impact of intervention. Self-reported measures only.
Bentwich and Gilbey, 2017. Israel MMAT: 5	**Design:** Quantitative survey. **Aim:** To explore medical students' perceptions of the impact of art on their empathy and tolerance of ambiguity.	**Visual arts:** 90-minute lecture and discussion about 5 art images related to sick and dying people (e.g. The Doctor by Sir Luke Fildes) using the Visual Thinking Strategy (VTS) approach.	1st year medical students enrolled in a mandatory medical humanities course (n = 67 from a population of 120, response rate 56 %). Two groups of students completed the survey consecutively (unmatched samples) in 2015 and 2016.	Survey with Likert-style items; 4 items in 2015 and 6 in 2016 administered post the intervention.	67 % of students felt the activity enhanced their acceptance of multiple meanings. 34 % of students felt the activity enhanced their ability to feel the suffering of others. Significant moderate-to-high correlations were found in 4 questions related to tolerance of ambiguity and empathy (0.874, p ≤ 0.01 and 0.707, p = 0.01).	The visual art intervention enhanced medical students' tolerance of ambiguity and the authors posit that this impacted their self-perception empathy. **Limitations:** Use of self-report post-test survey that had not been validated; lack of a control group.
Leyva-Moral et al., 2021 Spain MMAT: 6.5	**Design:** Mixed-methods **Aim:** To evaluate nursing students' satisfaction with narrative photography as a method for developing empathy towards people living with HIV.	**Visual arts:** Narrative photography training activity using Photovoice and photo-elicitation approaches. Students were shown written stories and videos after which they represented their feelings using up to three photographs or drawings and brief reflective explanatory text.	1st year nursing students (n = 17).	32-Item survey developed by the researchers with attitude, skills and satisfaction items. Qualitative data were collected using one open-ended question.	82.4 % (n = 14) agreed that narrative photography helped them to develop reflective thinking skills and to perceive how people living with HIV may feel. 88.2 % (n = 15) agreed that narrative photography helped them to eliminate some of their prejudices about HIV/AIDS, consider different points of view, understand the importance of providing humanised care, and identify discriminatory behaviours. 41.2 % (n = 7) were satisfied that the intervention helped them understand empathy. Analysis of the open-ended question indicated that the intervention helped students develop an empathic attitude.	Participants' satisfaction with narrative photography as a teaching strategy was high with regards to its capacity to influence their attitudes and biases towards people living with HIV/AIDs. **Limitations:** Small sample size, no evidence of psychometric testing of survey.
Wikström, 2003 Sweden MMAT:4.5	**Design:** Quasi-experimental **Aim:** To identify the impact of a visual arts	**Visual arts:** A teaching intervention using a reproduction of Edvard	1st year nursing students (n = 144). Group A (intervention): n = 72	Both groups completed the semi-structured Wheel Questionnaire which	Significant improvement in pre post scores for Group A compared with Group B in emotional	The visual arts intervention had a positive impact on students' emotional

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Table 2 (*continued*)

Author/ country/ quality score	Design, aim	Intervention	Discipline/sample	Instrument/analysis	Key results	Conclusion and limitations
	strategy on nursing students' emotional investment and motivation to learn about empathy.	Munch's painting 'The Sick Girl'.	Group B (control): n = 72. Participants exposed to classroom-based dialogues on empathy.	includes measures of structure, motivation and emotional involvement in response to an imagined or experienced empathy provoking situation.	investment and structure ($p = 0.01$). No difference between groups in motivation ($p = 0.20$): Emotional investment in learning about empathy: Group A: Pre-test M = 1.4; post-test M = 1.7 Group B: Pre-test M = 1.3; post-test M = 1.2. (A vs B: $F = 6.2$, $p = 0.01$). Group A: Pre-test M = 0.2; post-test M = 0.4. Group B: Pre-test M = 0.2; post-test M = 0.3 (A vs B: $F = 5.6$ $p = 0.01$).	investment and structure to learn about empathy. 'Motivation' scores were similar between groups. **Limitations:** Self-report.
Zazulak et al., 2015 Canada MMAT: 3	**Design:** Quasi-experimental **Aim:** To evaluate the impact of a visual literacy program (visit to art museum) on health science students' empathy levels.	**Visual arts:** A 42-hour facilitated visual literacy program at the McMaster Museum of Art.	Health sciences students (n = 18). Group A (intervention): n = 9 Group B (control): n = 9. Normal curriculum.	Interpersonal Reactivity Index (IRI) completed pre post intervention. Intervention group also responded to open ended questions related to the impact of the program for their empathic development.	No significant differences between pre-post IRI scores for either group. Group A (IG) pre-test = 68.9 ± 13.1; post-test = 70.7 ± 14.4; $t(9) = 0.7311$, $p = 0.48$; Group B (CG) pre-test = 71.0 ± 11.8; post-test = 71.3 ± 9.8; $t(8) = 0.1183$, $p = 0.91$. Subcomponent analysis of the IRI revealed a significant positive effect on cognitive aspects of empathy. This was confirmed by students' narrative reports.	The visual literacy program did not have a significant impact on participants' overall IRI scores. **Limitations:** Small sample size
Potash et al., 2014 Hong Kong MMAT: 5	**Design:** Mixed methods **Aim:** To identify whether an art making workshop improved medical students' empathy scores.	**Visual arts and poetry:** A: 3-hour workshop comprised of poetry writing, art and submission of a reflective essay.	3rd year family medicine students (n = 106/161; response rate 66 %). Group A (intervention): n = 48 Group B (control): n = 58. Participants exposed to workshop comprised of role play, problem-solving activity and submission of a case commentary.	Jefferson Scale of Empathy (JSE) (student version) completed pre post intervention. Qualitative analysis: of reflective essays	Significant *decline* in pre-post JSE-HPS scores for group A by end of rotation and downward trend for Group B. Group A: pre: 106.6 (SD12.4); post 102.2 (SD 14.3): $t = 2.57$, $p \leq 0.05$. Group B: pre: 107.2 (SD 11.5); post 106.6 (SD 14.7) NS. Reflective essays: Students perceived benefits to the art-making workshop and understanding gained. Qualitative themes included: self-awareness, patient awareness and understanding pain and suffering.	The JSE scores decreased for both groups. However, the authors suggest that the intervention promoted greater self-awareness which may help medical students recognise the potential for emotions to influence medical decision-making. **Limitations:** Single cohort and relatively small sample. It was not possible to determine if it was the intervention or the other activities that occurred during the rotations that influenced the results.
Potash et al., 2014 Korea MMAT: 3	**Design:** Quantitative survey. **Aim:** To explore the impact of art on medical students' empathy levels.	**Visual arts:** Students observed works of art developed by students from Hong Kong. They then created their own art work based on their emotional response to one of the pieces in the exhibit.	3rd-year medical students (n = 14)	State Empathy Scale completed pre-post intervention	State Empathy Scale scores increased pre-post for 6 of the 10 items only.	Medical student-generated artwork has the potential to enhance students' understanding of the humanistic aspects of healthcare including empathic responses to patient experiences. **Limitations:** Single cohort and small sample size. Use of a self-report survey.
Wikström, 2001 Sweden MMAT: 5	**Design:** Qualitative descriptive **Aim:** To determine students'	**Visual arts:** A teaching intervention using a reproduction of Edvard Munch's painting 'The	Nursing students (n = 428) from two universities	Stage 1: Individual written reports with respect to how empathy was	Key themes: • the expression of empathy in the	The ambiguity evident in the art work stimulated the students' imagination

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Table 2 (*continued*)

Author/ country/ quality score	Design, aim	Intervention	Discipline/sample	Instrument/analysis	Key results	Conclusion and limitations
	interpretation of how empathy is expressed in a work of art.	Sick Girl' with a specific focus on personal knowledge of empathy.		expressed by the subjects and the context portrayed in the art work. Stage 2: Group discussions on the pros and cons of using the art work to discover personal knowledge of empathy.	subject's body language • Reconsidering personal opinions and knowledge about empathy • Using fantasy to interpret the situation in the artwork and it application to nursing.	and discovery of their personal knowledge of empathy. **Limitations:** Minimal description of analytical approach used and limited data included in the paper.
Film						
Ahmadzadeh et al., 2019 Iran MMAT: 5	**Design:** Cluster RCT **Aim:** To identify whether watching a film about the patient-physician encounter alone or in combination with a communication skills training workshop improved medical students' empathy scores.	**Film:** 'The Doctor' and 3-h workshop on doctor-patient communication.	4th–7th year medical students (n = 133). Group A (intervention): n = 42. 3-h workshop on doctor-patient communication. Group B (intervention): n = 23. Viewed the film 'The Doctor'. Group C (intervention): n = 22. Viewed the film 'The Doctor' and participated in a 3-h workshop on doctor-patient communication the next day. Group D (control): n = 46. no intervention.	Jefferson Scale of Empathy (JSE) Student version completed pre, post and one month following intervention. **Analysis:** Data were analysed using paired t-tests and a linear mixed effect model analysed the effect of the intervention across groups and in consideration of the effect of variables.	There was no significant difference in baseline JSE scores between groups. All of the interventions had a positive effect on JSE scores for the intervention groups compared to control group. Significant pre-post improvement in JSE scores remained for group A ($p = 0.015$) and C ($p = 0.001$) one month later. **Effect:** Cohen's d index for Group A showed a moderate effect $d = 0.47$ and Group C had a large effect $d = 0.77$.	Watching the film 'The Doctor' had a significant but transient effect on empathy scores. Inclusion of a 3-h communication workshop had a greater effect on empathy one-month post intervention. **Limitations:** Single site. Participants were not randomly assigned to groups and age and educational level differed significantly between groups. The film was shown in English with Persian subtitles which may have impacted results. Self-reported measures only.
Briggs and Abell, 2012 USA MMAT: 5	**Design:** Mixed methods **Aim:** To identify whether watching a film about a dying woman improved nursing students' empathy scores.	**Film:** The film 'Wit' (90 min)	2nd year nursing students (n = 39) (response rate 100 %). Group A (intervention): n = 20 Group B (control): n = 19. 60-minute non-related lecture on opportunities in nursing. Both groups started the session with a 40-minute lecture/discussion on the topic of caring in nursing.	Jefferson Scale of Empathy (JSE) student version, completed pre and post intervention, and 7 weeks later. Group A students were also asked to respond to an open-ended question: 'What effect did this film have on your perception of nursing and patient care?'.	Significant increase in JSE scores in Group A from pre-test to post-test 1 and 2. No significant difference in JSE scores for Group B (control group) from pre-test to post-test 1 or 2. Paired t-tests revealed a significant difference between pre-post scores with group A scores higher pre-test to post-test 1 ($t = 4.56$; $p = 0.0002$) and 2 ($t = 4.75$; $p = 0.0001$). There was no significant difference for Group B for pre to post-test 1 ($t = 0.77$; $p = 0.45$) or 2 ($t = 1.55$; $p = 0.14$). **Effect:** (Eta squared statistic) 0.15 (large effect). **Emergent themes:** 1. The importance of empathy and caring; 2. Improved perspective; 3. The value of the nurse's role; 4. Mistakes to avoid.	Watching the film 'Wit' had a significant effect on empathy scores compared to an unrelated lecture. The impact of the film on empathy scores was sustained seven weeks later. **Limitations:** Self-report survey, female gender bias and sample size.
Drama						
Bas-Sarmiento et al., 2017	**Design:** Quasi-experimental **Aim:** To determine the	**Drama:** 20 h of training (10 weeks × 2 × 2-hour sessions) consisting of	2nd year undergraduate nursing students (n = 48)	Jefferson Scale of Empathy (JSE) completed pre-	Mean JSE scores pre-test = 119.9 (SD 8.44), were significantly different for	Results suggest that the 20 h of training over one semester was

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Table 2 (*continued*)

Author/ country/ quality score	Design, aim	Intervention	Discipline/sample	Instrument/analysis	Key results	Conclusion and limitations
Spain MMAT: 5.5	efficacy of role plays for improving nursing students' empathy scores.	role-plays and reflective writing.	enrolled in an interpersonal communication skills subject.	intervention. Reynolds Empathy Scale (RES) used to evaluate students' perceptions of performance pre, post and one month following intervention. Consultation and Relational Empathy (CARE) measure used to evaluate patient's perceptions of students' behaviour during the role play. Three independent external observers rated students' empathic behaviours using the Carkhuff Scale. Students' perception of their learning was evaluated after the training using a 0–10 scale.	men and women. ($p = 0.031$). Mean RES score pre-test 66.1 (SD 14.3), post 82.6 (SD 13.4), at one month 81.5 (SD 13.6). **Effect:** RES scores revealed a large effect size ($d = 1.91$, r- 0.51) that was lower after one month ($d = 1.10$, $r = 0.48$**).** Mean CARE scores pre-test 22.6 (SD 2.2), post 28.5 (SD 6.6), at one month 32.8 (SD 9.2). **Effect:** CARE results revealed a large effect size ($d = 1.91$, r- 0.51) which was maintained at one month ($d = 1.52$, r- 0.60) Observers (n = 3) reported significant differences based on the Carkhuff Scale pre-post ($p < 0.001$) intervention. Mean scores for students' perception of their learning was 7.97/10.	effective in increasing and sustaining students' empathy levels. Triangulation of measures and including patient's perceptions of students' empathy were a key strength of this study. **Limitations:** Gender bias – 80 % of the participants were female, single group study with small sample size.
Ozcan et al., 2011 Turkey MMAT: 5	**Design:** Quasi-experimental **Aim:** To explore the use of drama for developing nursing students' empathy skills.	**Drama:** 12 × 2-h weekly group based expressive art and psychodrama sessions.	Third year and senior, female nursing students (n = 48) in five different groups.	The Empathic Skill Scale completed pre-post intervention.	Each group demonstrated significant improvements in pre post empathy scores. Overall means: Pre: 127.97 (SD = 21.26) Post: 138.87 (SD = 20.40). ($t = 3.996$, $p \leq 0.001$). **Effect:** JSE scores revealed a moderate effect size ($d = 0.52$ r- = 0.25).	The drama-based expressive art and psychodrama sessions had a significant impact on empathy scores. **Limitations:** Small sample size, gender bias, self-report.
Zelenski et al., 2020 USA MMAT: 5	**Design:** Mixed methods **Aim:** To evaluate the impact of theatre techniques (improvisation) on healthcare students' empathy towards other healthcare professionals.	**Drama:** 15-hour interprofessional course designed to teach empathy using improvisation.	Nursing, pharmacy and medical students (n = 86) Group A (intervention): n = 45 Group B (control): n = 41. Usual curriculum.	Interpersonal Reactivity Index (IRI) and Consultative and Relational Empathy (CARE) measure completed pre post intervention. Facial expression recognition task used to measure empathy in the pre-post intervention periods. Eight students were interviewed.	Significant improvement in pre-post CARE scores for Group A. No improvement in pre-post CARE scores for Group B. On the IRI, personal distress scores decreased significantly in both groups (i.e., positive outcome) Facial recognition was the same in both groups. Interviewed students reported a positive impact on their interprofessional relationships and on their ability to think on their feet.	The improvisation activity had a positive impact on aspects of empathy identified in the IRI and CARE. **Limitations:** Sample was from one USA university only.
Digital stories Petty, 2021 United Kingdom MMAT: 6	**Design:** Mixed methods **Aim:** To explore nursing students' perceptions of digital storytelling as a strategy to enhance empathy skills.	**Digital stories:** that used illustrations, animation, voice and text to depict stories of parents.	1st, 2nd and 3rd year children's branch nursing students: n = 67.	All students completed a short structured survey and two open-ended questions. Seven students participated in interviews.	Evaluations were mostly positive. The digital stories were well received by students, not only aiding their learning, but also eliciting an empathic response.	The digital stories evoked an empathic response in students as they provided a deeper understanding of parents' experiences, viewpoints and feelings. **Limitations:** Self-report. Small sample

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Table 2 (*continued*)

Author/ country/ quality score	Design, aim	Intervention	Discipline/sample	Instrument/analysis	Key results	Conclusion and limitations
						size, no evidence of psychometric testing of survey.
Yu et al., 2021 United Kingdom MMAT: 6	**Design:** Cluster RCT **Aim:** To evaluate the effectiveness of digital stories on nursing students' empathy scores.	**Immersive digital story:** that portrayed the story of a person hospitalised for cancer treatment via a series of video clips.	2nd year nursing students (n = 238). Group A: (intervention) n = 100 Group B: (control) n = 138. Empathy lecture only.	The Jefferson Scale of Empathy - Health Professional (JSE - HP) version was completed pre post intervention and after 8–12 weeks.	There was no difference in JSE-HP scores between groups at baseline (p = 0.760). Significant difference between groups in immediate post-test scores: Group A: M: 118.76, (*SD*: 10.65) Group B: M: 114.60, (*SD*: 15.40) (A vs B: p = 0.012) At 8–12-weeks JSE scores had declined; no significant differences between groups: Group A 113.66 (*SD* = 13.82) Group B: 114.83 (*SD* = 13.79) (p = 0.364) **Effect: moderate effect *d* = 0.43, *r* = 0.21**	The digital story intervention produced an immediate increase in empathy levels in the intervention group but this was not sustained over time. **Limitations:** Convenience sampling, single site, female gender bias. JSE HP used rather than student version.
Literature						
Collins et al., 2017 USA MMAT: 5	**Design:** Quasi-experimental **Aim:** To identify whether reading fiction improved pharmacy students' empathy scores.	**Literature:** Reading short excerpts of literary fiction over eight weeks.	Pharmacy students (n = 21). Group A (intervention): n = 11 Group B (control): n = 10. Usual curriculum.	Jefferson Scale of Empathy (JSE), Health Profession Students, completed pre-post intervention.	Non-significant improvement in pre-post JSE-HPS scores for the intervention group: pre: 112.1 ± 10.7; post: 116.1 ± 7.4; p = 0.201. **Effect:** JSE-HPS results revealed a moderate effect size (*d* = 0.43, *r*- = 0.21) for Group A. Pre-post JSE-HPS scores decreased in the control group: pre: 118.7 ± 12.6; post: 113.0 ± 15.9; p = 0.188. Changes were not significant when comparing groups' post JSE-HPS scores (p = 0.580) or changes in individual performance (p = 0.061).	Reading short excerpts of literary fiction had a positive but non-significant impact on empathy scores compared to usual curriculum. **Limitations:** Self-report survey, female gender bias and sample size.
Creative writing						
Laughey et al., 2021 United Kingdom MMAT: 6.5	**Design:** Social constructivist approach **Aim:** to explore how medical students' feelings about empathy change as they progress through medical school.	**Creative writing:** Medical students wrote love and break up letters to empathy with regards to patient care.	4th and 5th year medical students (n = 20)	Reflexive thematic analysis of focus group interview data and letters	**Three major themes:** • Art and artifice • Empathic burden • Empathy as a virtue.	**Limitations:** Single site. Creative writing may not elicit authentic student reflections when this type of activity is mandatory course work.
Narrative medicine						
Yang et al., 2018 China MMAT: 6	**Design:** Cluster RCT **Aim:** To determine the effectiveness of a narrative medicine educational intervention on the empathic abilities of nursing students.	**Narrative medicine:** 12 × 1-hour sessions on narrative medicine theory, viewing and discussing movies (Wit, Tuesdays with Morrie and Patch Adams), and reading and analysis of narrative books.	Nursing students (n = 177 from a population of 180; response rate 98 %). Group A (control): n = 60 Group B: (intervention) n = 60 Group C: (intervention)	Jefferson Scale of Empathy (JSE) (Chinese version) completed pre-intervention and at five time points post intervention, the last being 1.5 years post intervention.	There was no difference in JSE scores between groups at baseline. The JSE scores of the three groups changed over time. Only Group C (IG) reported significantly higher improvement in pre-post	The narrative medicine program that combined theory and practice had a significant impact on empathy scores. **Limitations:** Female gender bias. Data collected over several

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Table 2 (*continued*)

Author/ country/ quality score	Design, aim	Intervention	Discipline/sample	Instrument/analysis	Key results	Conclusion and limitations
			n = 60. Intervention plus clinical practice experiences. Students listened to patients' stories and wrote about the patient life experiences, feelings and needs. They then exchanged diaries with one patient and each group gave a presentation about what they had learned from the program		scores T1: M = 104.79 (SD11.82) to T6 109.98 (SD13.37), $p < 0.05$. **Effect:** JSE results revealed a moderate effect size ($d = 0.41$, $r = 0.20$) in Group C (IG) after the intervention Group 3 (IG) empathic ability increased rapidly after T3 (after the two-term intervention) and differences in empathic ability between T1 and T3, T4, T5 and T6 were statistically significant ($P < 0.05$).	years but from only one university.
Combined arts Jensen and Curtis, 2008 USA MMAT: 7	**Design:** Qualitative descriptive **Aim:** To explore the meanings student derive from integration of liberal arts content into a psychosocial nursing class.	**Art, literature, music, and film** – 3-hour per week for 15 weeks.	Junior nursing students (n = 23; 21 female, 2 male) aged 20–38 years	Focus group interviews, questionnaires and observation. Inductive analysis.	**Emergent themes:** an interesting hook, a deeper level of understanding, developing self-understanding and cultural awareness. Under the developing empathy theme participant quotes included: • feeling a little more empathic • learned how to 'put yourself in some else's shoes' • recognising how mental health challenges can 'disrupt a family' • a better understanding of what is going on inside the head of someone with a mental illness.	**Limitations:** Female gender bias. Single site. Limited detail provided about the nature of empathy and its acquisition.
McGarry et al., 2013 United Kingdom MMAT: 2	**Design:** Mixed methods **Aim:** To explore students' perspectives of an arts based educational program	**Art, drama, dance:** One-day workshop where students worked alongside individuals with learning disabilities to produce art, dance, and drama sketches.	Nursing students (n = 45) from adult and mental health branches	Validated questionnaire with 8 Likert-style and open-ended questions.	Mean scores for each question ranged from 1.5 to 4.5/5; overall mean 2.2. Analysis of open-ended comments identified mainly positive responses: • eye opening/really showed how people might be feeling • revealed how people may be excluded due to communication barriers • the difficulties faced by people with a learning disability and the implications that this might have. Students felt challenged as they were pushed beyond the comfort zone of a regular classroom environment and reported a greater understanding of core	**Limitations:** Likert questions did not explore empathy – students' perception only.

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Table 2 (*continued*)

Author/ country/ quality score	Design, aim	Intervention	Discipline/sample	Instrument/analysis	Key results	Conclusion and limitations
					concepts such as empathy, dignity, stigma, and social exclusion	

Legend: IG = Intervention group; CG = Control group. Effect size: Cohen's '*d*' and the effect-size correlation, '*r*' were computed using means and standard deviations of two groups (treatment and control) and online tool (https://lbecker.uccs.edu/effect-size). Effect computed from paired *t*-tests: Eta squared statistic, effect size 0.15 = large effect

5.4.1. *Understanding of and empathy towards peoples' lived experience of suffering*

Jensen and Curtis (2008) examined the meanings that nursing students derived from inclusion of visual arts, literature, music and film in curricula. The findings from questionnaires, class observations and focus group interviews indicated that students believed that use of the arts in teaching allowed them to '*put themselves in someone else's shoes*' (p. 6) and to better understand what people with schizophrenia '*have to endure*' (p. 6). Similarly, In Potash et al.'s (2014) mixed methods study of family medicine students, analysis of reflective essays revealed a deepening awareness of patient pain and suffering as a result of their participation in a workshop comprised of poetry, writing and art. The authors described how participation in the workshop supported medical students to learn to '*appreciate that pain and suffering exist in many forms*' (p. 4). It should be noted however, that in this study, as in a number of others, the depth of data reported was limited.

In Wikström's (2001) study, interpretation of Edvard Munch's painting 'The Sick Girl' stimulated nursing students' imagination and discovery of their personal knowledge of empathy and enabled them to recognise and relate to the empathy being expressed in a mother's body language. For example, '*The mother did not accept that the child was sick. She expressed feelings of sadness and despair*' (p. 27). In this study, the authors noted that the creation of a relaxed learning climate was critical to allowing students to explore and reflect on their empathic perceptions of the stimulus material, and that the role of the teacher was to simply encourage students to express their thoughts and feelings. The second key point noted by the authors was that the use of 'The Sick Girl' enhanced students' tolerance of ambiguity and allowed for deep discussion about the potential meanings evident in the mother – child image.

In a mixed methods study of an arts program where nursing students worked alongside individuals with learning disabilities to produce art, dance, and drama sketches (McGarry and Aubeeluck, 2013, p. 271), open-ended questionnaire responses revealed that participants believed that the experience was '*eye opening*', '*really showed how people might be thinking*', and '*the difficulties faced by people with a learning disability*'.

5.4.2. *Teaching and learning considerations*

Two of the studies reported that healthcare students could be challenged by art interventions, with one noting that drama-based approaches can '*push students beyond their comfort zone*' with some finding it difficult to engage due to not being '*particularly creative*' or unable to '*act out scenarios due to nerves*' (McGarry and Aubeeluck, 2013, p. 271). In Laughey et al.'s (2021) study, which used a creative writing activity, medical students reported that the activity helped them to view empathy as a professional virtue that leads to selflessness, connection and rapport building. However, these students also recognised that empathy can be difficult to demonstrate when caring for '*challenging*' patients (p. 397). The authors referred to empathy as both an art that can be difficult to master and an artifice that can be misused. For example, one student described how empathy can be '*faked*' particularly when being assessed, stating '*So it's going to be fake anyhow and you are assessing how good you are at faking empathy*'. Another said '*I've been faking it for so long*' (p. 397).

Participants in Laughey et al.'s study also described a dissonance between formal curricula that espoused the value of empathy and the hidden curriculum where empathic practice was not always role modelled and too often disparaged. From the students' perspectives, this was evident, not only in university-based settings, but also in clinical learning experiences, with one stating '*In the hospital it is discouraged … this changes our view on empathy*' (p. 402). These perceptions limited students' active involvement in arts-based education and led to resistance and feelings of discomfort.

5.5. *Quantitative study outcomes*

Six validated instruments were used to measure empathy and five studies employed tools developed specifically for the study with little or no evidence of psychometric evaluation. The most commonly used instrument (n = 7) for measuring empathy was the Jefferson Scale (Hojat et al., 2002). Other quantitative measures included the Toronto Empathy Questionnaire (Spreng et al., 2009), Interpersonal Reactivity Index (Davis, 1980), Reynolds Empathy Scale (Reynolds, 2000), State Empathy Scale (Shen, 2010), Consultation and Relational Empathy measure (Mercer et al., 2004), Empathic Skill Scale (Ozcan et al., 2011), and the Wheel Questionnaire (Wikström, 2003) which includes measures of structure, motivation and emotional involvement in response to an imagined or experienced empathy provoking situation. In one study by Bas-Sarmiento et al. (2017), three external observers independently rated students' empathic behaviours using the Carkhuff Scale (Carkhuff, 1969).

Three papers described the use of a survey designed to explore participants' perspectives of an arts intervention (Bentwich and Gilbey, 2017; Petty, 2021; McGarry and Aubeeluck, 2013), but most of the quantitative studies used quasi-experimental designs (n = 5) or cluster randomised control trials (RCTs) (n = 3). The majority of the pre-post studies measured changes in empathy scores immediately following the interventions. However, five papers also described longer term changes in empathy levels. These included Ahmadzadeh et al. (2019) and Bas-Sarmiento et al. (2017) who measured empathy one month following the intervention; Briggs and Abell (2012) who measured empathy seven weeks post intervention, and Yu et al. (2021) at 8–12 weeks. Yang et al. (2018) measured empathy scores at five time points, the last being 18 months post intervention. In most of these studies, as post-test duration increased empathy scores generally decreased.

Of the studies that presented quantitative outcome measures, nine reported significant ($p \leq 0.05$) gains in empathy scores at post-test and two reported non-significant gains. The three RCTs were the most valuable level of evidence in this regard as they conducted a two-way comparison; the intervention group's ratings were compared pre-test post-test, and post-test scores were compared between intervention and control groups.

Each of the RCTs used a version of the Jefferson Scale of Empathy. In Ahmadzadeh et al.'s (2019) RCT, empathy development in three groups of medical students exposed to different interventions (watching the film 'The Doctor'; participating in a three-hour communication workshop; film and workshop combined) was compared with a control group (normal curriculum). All three interventions had an immediate effect on

empathy scores compared to the control group, and this persisted at one month for the groups exposed to the workshop and the film/workshop combined.

Yu et al. (2021) conducted a RCT to evaluate the effect of an immersive digital story compared to a lecture about empathy. A significant difference between intervention and control groups was identified in the immediate post-test empathy scores, but there was no significant difference at 8–12 weeks.

In a RCT conducted by Yang et al. (2018), the impact of a narrative medicine intervention alone and narrative medicine combined with clinical experience were compared to a control group (normal curriculum). Although the empathy scores of all three groups improved pre-post, only the group exposed to both the narrative medicine intervention and clinical experiences demonstrated a significant improvement in empathy scores.

5.6. Effectiveness of arts interventions

Eight of the studies provided sufficient data to compute the effect size of the intervention and each of these demonstrated a significant effect on empathy scores (see Table 2). The effect sizes ranged from moderate ($d = 0.41$ to 0.52) to large ($d = 0.77$ to 1.19; eta = 0.15), with five demonstrating a moderate effect and three a large effect.

There was no discernible correlation between type or duration of interventions and their effectiveness. For example, Ahmadzadeh et al.'s (2019) five hour film/workshop intervention demonstrated a large effect size, while Ozcan et al.'s (2011) 24 h program of expressive art and psychodrama demonstrated a moderate effect. The largest effect size ($d = 1.19$) was seen in Bas-Sarmiento et al.'s (2017) study of a 20-hour intervention consisting of role-plays and reflective writing activities.

6. Discussion

This mixed methods systematic review sought to identify, critically appraise and synthesise evidence of the use and effectiveness of the arts for enhancing pre-registration/prelicensure healthcare students' empathy skills. This review appears to be the first to incorporate studies that used a range of methodologies, healthcare student groups and arts modalities.

The empirical studies included in this review described a wide range of arts inventions used with students representing a number of different healthcare disciplines and enrolled in different years of study. The duration and approaches used as well as the evaluation strategies were also diverse. Based on the majority of included studies, we have identified that arts interventions generally have a positive impact on healthcare students' empathy levels and allow them to gain a more nuanced conceptual understanding of empathy and patient suffering.

The synthesised findings from this review also allow for some suggestions to be offered on why the use of the arts may be beneficial for empathy development. The various types of arts modalities tend to be representational and metaphorical, conveying meanings and emotions that are often difficult to elucidate and evoke in other ways (McGarry and Aubeeluck, 2013; Wikström, 2001). A common feature of the arts is their subjective nature which challenges concrete thinking, enhances tolerance of ambiguity, and stimulates construction of new meanings shaped by the context and experience of both the artist and the learner (Bentwich and Gilbey, 2017; Blomqvist et al., 2007). Additionally, as Tyng et al. (2017) have noted, evoking emotions such as empathy has a particularly 'strong' and positive influence on learners' attention, and perceptual processing. In shifting emotions and related meanings, arts modalities enable students to focus on and develop new and divergent perspectives and worldviews which is critical for empathy development (Wikström, 2003). Further, arts modalities can connect and challenge learners as they tend to be universally evocative although subjectively experienced, often transcending cultural and linguistic barriers, and appealing to learners from diverse backgrounds (Clover, 2006). Engaging with the arts and provoking an emotional resonance can stimulate empathic imagination (Levett-Jones and Cant, 2020; Potash et al., 2014), while at the same time promoting curiosity and dialogue around differences (Savva and Telemachou, 2016). Although illness and suffering are too often viewed from an objective, solution-focused, biomedical stance, arts-based experiences that allow for engagement in affective learning and generation of authentic and thoughtful discussions, can lead to new insights into the human condition, and the generation of empathic humility (Levett-Jones and Cant, 2020).

It should be noted that, in addition to the positive outcomes reported, the results from the included studies also suggest that arts-based education can be perceived negatively by some students. In particular, drama-based approaches that require students to engage in performance, were sometimes viewed as difficult, uncomfortable, and anxiety provoking, especially for students those who do not consider themselves to be creative (McGarry and Aubeeluck, 2013). Ostensibly, while the meanings and emotions evoked by the arts can provoke learning, eliciting discomfort may prove a hinderance, potentially causing students without a background and interest in arts to disengage.

What was not clear from the review is whether any particular student characteristics such as age, ethnicity or year of enrolment may have influenced empathy development. Further, there were no definitive aspects of the interventions that seemed to guarantee success. However, it is clear that arts approaches are more likely to be effective when used as a stimulus for active learning and supported with group-based facilitated discussion and/or reflection exercises. There is also a need for educators who use arts-based pedagogies to create a safe, respectful, collegial, and trusting learning milieu, in order to promote learning and meaningful discussion, and to limit students' resistance and feelings of discomfort (SmithBattle, 2012; Haidet et al., 2016).

6.1. Limitations

A number of the study designs presented in this review were at the lower end of the scale of evidence with only three RCTs identified. Although most of the quantitative studies identified significant improvements in students' empathy levels immediately after arts-based interventions, the use of measurement instruments that were not psychometrically tested could have impacted the validity of some of the results. Additionally, the use of self-report scales may mean that the results were influenced by social desirability bias. Importantly, few of the included studies reported on long term impact and none examined transfer of learning to practice. Lastly, although a rigorous approach was used in the review process, in line with recognised frameworks for conducting systematic reviews, we recognise that a key limitation is the exclusion of articles published in languages other than English.

7. Conclusion

The use of the arts in healthcare education is not new, although it remains an approach that is not commonly integrated into curricula. This may be because art-based pedagogies tend to be dependent on the personal interests and enthusiasm of individual educators or because there is a limited understanding of the conceptual and pedagogical features needed to guide curriculum integration. This study has sought to provide a better understanding of the use of the arts for enhancing healthcare students' empathy skills, and seeks to join with other emergent perspectives to form part of a growing understanding of this phenomenon. Ultimately, it is hoped that this review will lead to a renewed interest in arts pedagogies, recognising that these modalities have unique qualities that foster empathic responses, engagement, creativity and new understandings.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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