Effects of empathic and positive communication in healthcare consultations: a systematic review and meta-analysis

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Summary

Background: Practitioners who enhance how they express empathy and create positive expectations of benefit could improve patient outcomes. However, the evidence in this area has not been recently synthesised.
Objective: To estimate the effects of empathy and expectations interventions for any clinical condition.
Design: Systematic review and meta-analysis of randomised trials.
Data sources: Six databases from inception to August 2017.
Study selection: Randomised trials of empathy or expectations interventions in any clinical setting with patients aged 12 years or older.
Review methods: Two reviewers independently screened citations, extracted data, assessed risk of bias and graded quality of evidence using GRADE. Random effects model was used for meta-analysis.
Results: We identified 28 eligible (n = 6017). In seven trials, empathic consultations improved pain, anxiety and satisfaction by a small amount (standardised mean difference −0.18 [95% confidence interval −0.32 to −0.03]). Twenty-two trials tested the effects of positive expectations. Eighteen of these (n = 2014) reported psychological outcomes (mostly pain) and showed a modest benefit (standardised mean difference −0.43 [95% confidence interval −0.65 to −0.21]); 11 (n = 1790) reported physical outcomes (including bronchial function/ length of hospital stay) and showed a small benefit (standardised mean difference −0.18 [95% confidence interval −0.32 to −0.05]). Within 11 trials (n = 2706) assessing harms, there was no evidence of adverse effects (odds ratio 1.04; 95% confidence interval 0.67 to 1.63). The risk of bias was low. The main limitations were difficulties in blinding and high heterogeneity for some comparisons.

Conclusions: Greater practitioner empathy or communication of positive messages can have small patient benefits for a range of clinical conditions, especially pain.
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Keywords

Communication, family medicine, evidence-based practice

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Introduction

Communication between patients and practitioners lies at the heart of healthcare. It can enhance diagnostic accuracy,[1] promote patient-centred treatment decisions[2] and improve a number of clinical outcomes ranging from treatment adherence[3] to safety.[4] Good communication can also lower the risk of malpractice claims.[5]

Much of the recent research in this area has focused on whether empathic and positive communication are beneficial,[6,7] and whether empathic communication can be taught (it seems that it can).[8] A 2001 systematic review found that empathy and positive communication might also improve patient outcomes.[9] However, the evidence has moved on significantly, with numerous randomised trials having been published since,[10–29] not all of them with positive findings.[28,30] A more recent attempt at synthesising the evidence focused exclusively on pain.[31] However, communication interventions are likely to have more general effects across a range of conditions, so it is desirable to evaluate their effect upon

multiple outcomes in the context of the same review.[32]

In this systematic review and meta-analysis, we aimed to combine data from all available randomised trials of *empathy interventions* (where practitioners deliver enhanced empathy) or *expectations interventions* (where practitioners deliver positive messages to promote positive patient expectations about outcomes) on patient health for any condition.

Methods

Data sources and searches

We followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines[33] and searched the following databases from inception to 10 August 2017: MEDLINE, CENTRAL, EMBASE, PsychINFO, CINAHL, ProQuest. The full search strategy is further detailed within eMethods and eTable 1 in the Supplement.

Study selection

Randomised trials (including cluster randomised trials) in any disease area were eligible for inclusion. We included trials in which patients aged 12 years or older were involved in a face-to-face interaction with a healthcare practitioner (such as a physician, nurse or allied health professional).

Eligible studies fell into two categories. First, those that randomised participants to enhanced practitioner empathy ('empathy interventions') or usual care (see eMethods in the Supplement). Empathy intervention trials were those in which empathy was explicitly manipulated. Within the healthcare setting, empathy is taken to involve shared understanding, and making a therapeutically helpful suggestion based on that shared understanding.[34] Second, those that randomised participants to enhanced positive messages aimed at promoting positive patient expectations about recovery ('expectation interventions') or usual care. We combined these two types of trials because patients consider appropriately positive messages to be part of empathy[34] and because previous reviews in this area have done so.[9,31] To minimise risk of bias, we excluded quasi-randomised trials or observational studies, and studies at high risk of bias for random sequence generation.[35]

We excluded studies in which the intervention was *negative*. These were trials in which a practitioner would deliver a negative message or reduce their empathy. This is because these studies are not clinically relevant and experimental: one would not encourage a clinician to intentionally give unempathic or negative consultations.

Data extraction and risk of bias assessment

Two researchers (from JH, AM, ED, XYH) independently screened titles and abstracts. Full-text articles were then reviewed in duplicate and disagreements resolved by discussion with a third reviewer. We extracted data about: details of study design, types of participants, description of intervention, description of comparison group, completeness of outcome data, outcome measures, setting, country and funding source. If not reported, study authors were contacted. We assessed the risk of bias based on the Cochrane criteria (see Supplement).

We classified studies as being at a high risk of bias overall if they were scored as at high or unclear risk of bias for either sequence generation or allocation concealment domains, based on growing empirical evidence that these factors are particularly important potential sources of bias (see eMethods in the Supplement for details).[35] To evaluate the overall quality of evidence, we used the GRADE system for all three primary outcomes,[36] using GRADEpro software to prepare the Summary of Findings tables.[37]

Outcomes

Primary outcomes were physical or psychological, or harms. When studies reported more than one physical or psychological outcome or harm, we chose the one that the study authors reported as primary, or the outcome for which a sample size calculation was made. If the primary outcome was unclear and there was no sample size calculation, we selected the outcome judged by two independent clinicians (GL and AM) to be most clinically relevant. For example, we deemed longer-term follow-up (weeks or months) to be more clinically relevant for chronic pain. Because empathy and expectations interventions could have global effects, we also collected data on patient satisfaction, quality of life and cost-effectiveness as secondary outcomes.

Pain outcomes were challenging to classify because they can be categorised as both physical and psychological.[38] Hence, we conducted subgroup analyses with pain studies. Because the measures of pain in this review were mostly subjective patient reports, we classified pain as psychological in our main analysis.

Data synthesis and analysis

Due to the nature of these types of behavioural interventions,[39] we anticipated a degree of heterogeneity

of populations, interventions and effect sizes. We pooled results that were sufficiently similar in terms of intervention content using a random effects analysis (see eMethods in the Supplement).[35] Except for harms (where all outcomes were dichotomous), we converted odds ratios to standardised mean differences.[40] To estimate harms, we analysed data based on the number of events and the number of people assessed in the intervention and comparison groups, then calculated odds ratios and 95% confidence intervals. We conducted analysis on an intention-to-treat basis wherever possible. Otherwise, we analysed data as reported. To assess the degree of variation between studies, we did heterogeneity tests with Higgins' I^2 statistic.[35] Where heterogeneity was present in pooled effect estimates, we explored possible reasons for variability by conducting subgroup and sensitivity analyses.

When three or more trials investigated the effects of modifying practitioner empathy and/or inducing positive patient expectations upon a particular condition or clinically relevant outcome, we analysed these trials in separate subgroups. This was in order to identify any condition-specific effects of empathy and expectations.

We conducted two sensitivity analyses. In the first, we excluded studies with high risk of bias; in the second, we excluded studies where assumptions about data had to be made because of missing data, for example, the imputation of missing standard deviation values for continuous data.

Results

We identified 26,902 non-duplicate citations from our searches (eFigure 1 in the Supplement). Of these, 29 studies were eligible for inclusion in this review (Table 1, eTable 2 in the Supplement).[10–30,41–46]

Empathy interventions

Seven trials (n = 2169) tested the effects of empathy interventions.[11,13,14,17,23,26,30] Two of these were carried out in each of: the United Kingdom and France; and one in each of: Japan, United States and Sweden. Most studies were conducted in primary care, and the timing of the outcome assessment ranged from immediately after the intervention to three weeks. The studies included between 28[26] and 818 patients,[29] with an average of 317 (Table 1).

The interventions within these trials involved practitioners displaying a range of verbal and non-verbal behaviours (eTable 3 in the Supplement). These behaviours were all similar because they instantiated the same conceptualisation of empathy (see Methods). The control groups in these trials received standard care, which did not involve additional time with the patient. The conditions and experiences included in these studies were chronic pain,[11,26,30] anxiety,[23] distress among cancer patients,[13] symptoms of irritable bowel syndrome[14] and satisfaction after primary care consultations.[17] Outcomes were assessed using questionnaires, validated symptom scores and visual analogue scores.

All but one study reported the same (positive) effect direction.[30] Enhanced practitioner empathy had a small patient benefit, with a standardised mean difference −0.18 (95% confidence interval −0.32 to −0.03; $I^2 = 55\%$) (Figure 1). A funnel plot did not reveal evidence of publication bias (see eFigure 2 in the Supplement); however, the funnel plots with so few studies are difficult to interpret so publication bias remains possible. The overall risk of bias for these outcomes was low, and the quality of the evidence was low (eTable 4 in the Supplement).

In the three empathy studies (n = 1214) reporting harms,[11,30] we found no significant between intervention groups (odds ratio 1.00 [95% confidence interval 0.40 to 2.48; $I^2 = 61\%$]) (eFigure 3 in the Supplement). The quality of the evidence was very low (eTable 4 in the Supplement).

One empathy intervention study[14] reported participant-assessed quality of life, using the 34-question irritable bowel syndrome Quality of Life[47] score. Empathic care seemed to improve quality of life (standardised mean difference 0.43 [95% confidence interval 0.13 to 0.73]). Four studies (including 955 patients) reporting satisfaction as an outcome[13,17,23,26] suggested that this was improved by a small and not statistically significant amount (standardised mean difference 0.26 [95% confidence interval −0.02 to 0.54; $I^2 = 67\%$]) (eFigure 4 in the Supplement).

There was no direct evidence on the cost-effectiveness of interventions designed to train clinicians in empathic behaviours. However, two empathy intervention studies reported how much time was allowed for physicians to respond to questions in an emphatic manner.[14,23] Practitioners took 50% more time (5 min for a 10-min consultation) to enhance empathy in one trial, and an additional 35–40 min in another.[14]

For our subgroup analysis investigating trials investigating the same condition, three empathy trials[11,26,30] reported effects of empathic care on pain (all chronic). These reported a non-statistically significant benefit (standardised mean difference −0.05 [95% confidence interval −0.32 to 0.22; $I^2 = 61\%$]) (eFigure 5 in the Supplement). For our sensitivity analysis of less biased trials, three studies were judged to have an unclear risk of bias for random allocation or

Table 1. Characteristics of included studies.

Study	Year	Country	No. patients	Interventions	Condition being treated	Timing of outcome assessment	Main reported psychological and physical outcomes and adverse events (and assessment tools)
Empathy							
Chassany[11]	2006	France	818	Intervention delivered by empathy-trained doctor vs. consultation delivered by untrained doctor	Osteoarthritis of knee or hip)	Over two weeks	**Physical:** n/a **Psychological:** pain (area under curve, based on 100mm VAS*) **Adverse events:** any reported
Fujimori[13]	2014	Japan	601	Intervention delivered by empathy-trained practitioner (based on SHARE model) vs. treatment delivered by untrained practitioner	Cancer	Immediately after intervention	**Physical:** n/a **Psychological:** Distress (Hospital Anxiety and Depression Score) **Adverse events:** n/a
Kaptchuk[14]	2008	USA	175	Augmented consultation vs. time-limited patient-practitioner relationship (initial consultation duration <5 minutes)	Irritable bowel syndrome (IBS)	3 weeks after intervention	**Physical:** n/a **Psychological:** IBS symptoms (IBS Global Improvement Scale) **Adverse events:** any reported
Little[17]	2015	UK	224	Intervention delivered by empathy-trained practitioner (based on KEPe-Warm model) vs. treatment delivered by untrained practitioner	Any condition in any patient attending their primary care doctor	Immediately after intervention	**Physical:** n/a **Psychological:** Satisfaction (7-point Medical Interview Satisfaction Scale) **Adverse events:** n/a
Soltner[23]	2011	France	68	Consultation by practitioner trained to provide additional empathy (with 5 min extra time) vs. consultation delivered by practitioner instructed to give a neutral consultation.	Gynaecological problem requiring day-care procedure	Immediately after intervention	**Physical:** n/a **Psychological:** Anxiety (100mm numerical VAS) **Adverse events:** Changes in acute psychological burden (scores 0-10)
Vangronsfeld[26]	2012	Sweden	28	Practitioner actively/empathically listening and validating during a 15 min consultation vs. usual care	Chronic back pain	Immediately after intervention	**Physical:** n/a **Psychological:** Pain (0-10 point scale) **Adverse events:** n/a

(continued)

Table 1. Continued.

Study	Year	Country	No. patients	Interventions	Condition being treated	Timing of outcome assessment	Main reported psychological and physical outcomes and adverse events (and assessment tools)
White[30]	2012	UK	221	Empathetic consultation vs. Non-empathetic consultation	Chronic osteoarthritis)	7 days after intervention	**Physical:** n/a **Psychological:** Pain (100mm VAS) **Adverse events:** Any reported
Expectations							
Benedetti[10]	2003a	Italy	42	Open delivery of analgesia (lidocaine) with positive message vs hidden delivery of analgesia without message	Post-op pain	30 and 60 min after intervention	**Physical:** n/a **Psychological:** Pain intensity (10-point VAS) **Adverse events:** n/a
Benedetti[10]	2003b	Italy	30	Open delivery of sedative (diazepam) with positive message vs hidden of sedative delivery without message	Post-op pain	2 hours after intervention	**Physical:** n/a **Psychological:** Anxiety (State–Trait Anxiety Inventory) **Adverse events:** n/a
Benedetti[10]	2003c	Italy	10	Open delivery of electrical subthalamic nucleus stimulation with positive message vs hidden delivery without message	Parkinson's disease	Immediately after intervention	**Physical:** Hand movement velocity (m/s) **Psychological:** n/a **Adverse events:** n/a
de Craen[41]	2001	Netherlands	111	Positive vs. neutral message	Chronic pain	Immediately after intervention	**Physical:** n/a **Psychological:** Pain (10cm VAS) **Adverse events:** any reported
Dutt-Gupta[12]	2007	n/a	101	Positive vs. neutral message	Acute pain	Immediately after intervention	**Physical:** n/a **Psychological:** Pain (10-point Verbal numerical rating scale). **Adverse events:** % of patients vocalising pain
Goodenough[42]	1997	Australia	36	Positive vs. neutral message	Acute pain	Immediately after intervention	**Physical:** n/a **Psychological:** Pain (Faces Pain Scale, scoring 0-6) **Adverse events:** n/a
Kemeny[15]	2007	USA	45	Positive vs. neutral message	Asthma	Unclear (most likely 1 week following treatment)	**Physical:** Calculated concentration of methacholine required to induce 20% decrease in FEV1 **Psychological:** n/a **Adverse events:** n/a

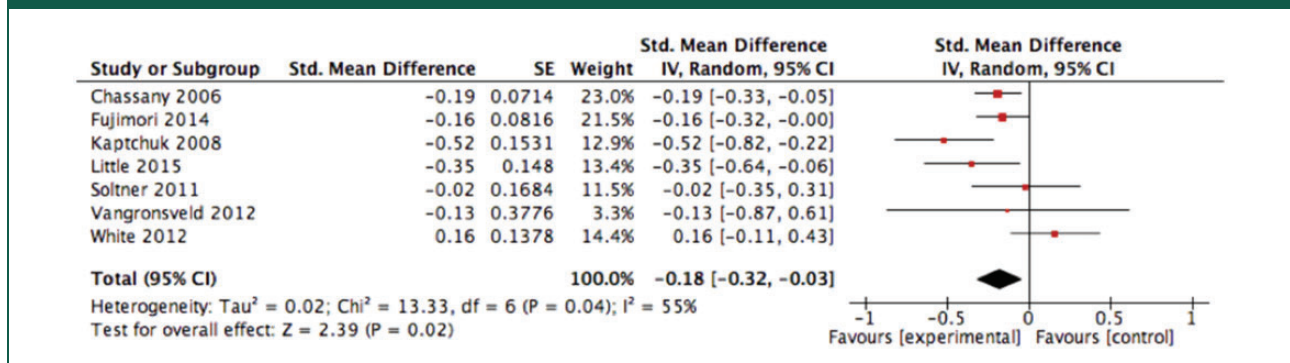(continued)

Table 1. Continued.

Study	Year	Country	No. patients	Interventions	Condition being treated	Timing of outcome assessment	Main reported psychological and physical outcomes and adverse events (and assessment tools)
Knipschild[16]	2005	The Netherlands and Belgium	128	Positive message and communication of certainty vs. neutral message	Acute pain	14 days following treatment	**Physical:** n/a **Psychological:** Feeling recovered from illness (yes/no) **Adverse events:** n/a
Lauder[43]	1995	UK	226	Positive vs. neutral message	Post-op nausea	24 hours after surgery	**Physical:** Antiemetic use **Psychological:** Nausea (10-point scale) **Adverse events:** Patient experience of vomiting or retching (yes/no)
Olsson[44]	1989	Sweden	100	Positive vs. neutral message	Acute streptococcal tonsillitis	Two days after intervention	**Physical:** n/a **Psychological:** Feel better after operation (yes/no) **Adverse events:** n/a
Petersen[19]	2012	Denmark	19	Positive vs. neutral message	Post-op neuropathic pain	Immediately after the intervention	**Physical:** n/a **Psychological:** Pain (10-point VAS) **Adverse events:** n/a
Petersen[18]	2014	Denmark	18	Positive vs. neutral message	Post-op neuropathic pain	Immediately after treatment	**Physical:** n/a **Psychological:** Pain (10-point VAS) **Adverse events:** n/a
Phillips[20]	2006	USA	80	Positive suggestion vs. neutral suggestion delivered by healthcare practitioner	Impaired physical function requiring rehabilitation	Immediately after intervention	**Physical:** Functional performance (7-point scale) **Psychological:** Self-efficacy (9-item Likert measure) **Adverse events:** n/a
Resnick[45]	1996	USA	77	Positive vs. neutral message	Impaired physical function among the elderly requiring rehabilitation	2 days after discharge	**Physical:** Functional performance (7-point scale) **Psychological:** Pain (11-point scale) **Adverse events:** n/a
Rief[21]	2017	Germany	78	Positive vs. neutral message	Disability after heart surgery	6 months after surgery	**Physical:** Physical quality of life (12-item Short Form Health Survey, 0-100)

Table 1. Continued.

Study	Year	Country	No. patients	Interventions	Condition being treated	Timing of outcome assessment	Main reported psychological and physical outcomes and adverse events (and assessment tools)
							Psychological: Pain (Disability Index, range=0-70) **Adverse events:** any reported
Ronel[22]	2011	Germany	28	Positive vs. neutral message	Acute chest pain with negative biomarkers	Immediately after intervention	**Physical:** % Diameter stenosis **Psychological:** Chest pain (10-point scale) **Adverse events:** n/a
Suarez-Almazor[24]	2010	USA	455	Positive vs. neutral message	Osteoarthritis of the knee	3 months after treatment	**Physical:** Mobility (timed get up and go test) **Psychological:** Pain (WOMAC subscale, range: 0-500) **Adverse events:** exacerbation of knee pain, bruising at injection site, cramps, headache, infection at needle site
Szilagyi[25]	2007	Hungary	60	Positive vs. neutral message	Osteoarthritis Ventilated for $\geq$48 hrs in a hospital ICU	2 weeks after treatment	**Physical:** Mean ventilation hours **Psychological:** n/a **Adverse events:** Deaths
Thomas[46]	1987	UK	200	Positive vs. neutral message	Undiagnosed symptoms experienced by primary care patients	Two weeks after consultation	**Physical:** n/a **Psychological:** Dichotomous (feel much better or not) **Adverse events:** n/a
Varelmann[27]	2010	USA	140	Positive suggestion vs. negative suggestion	Acute needle pain	Immediately after intervention	**Physical:** n/a **Psychological:** Pain (10-point VAS) **Adverse events:** n/a
Wang[28]	2008	China	241	Positive suggestion vs. neutral suggestion	Acute pain after abdominal hysterectomy	6 hours after surgery	**Physical:** Morphine consumption (mg) **Psychological:** Pain (10-point VAS) **Adverse events:** Various including nausea, dizziness, vomiting
Wise[29]	2009	USA	478	Positive vs. neutral message	Asthma	From baseline over 4 weeks	**Psychological:** Asthma quality of life **Physical:** Peak expiratory flow (PEF) **Adverse events:** Headaches

VAS: visual analog scale.

Figure 1. Effects of empathy interventions.

Study or Subgroup	Std. Mean Difference	SE	Weight	Std. Mean Difference IV, Random, 95% CI
Chassany 2006	-0.19	0.0714	23.0%	-0.19 [-0.33, -0.05]
Fujimori 2014	-0.16	0.0816	21.5%	-0.16 [-0.32, -0.00]
Kaptchuk 2008	-0.52	0.1531	12.9%	-0.52 [-0.82, -0.22]
Little 2015	-0.35	0.148	13.4%	-0.35 [-0.64, -0.06]
Soltner 2011	-0.02	0.1684	11.5%	-0.02 [-0.35, 0.31]
Vangronsveld 2012	-0.13	0.3776	3.3%	-0.13 [-0.87, 0.61]
White 2012	0.16	0.1378	14.4%	0.16 [-0.11, 0.43]
Total (95% CI)			**100.0%**	**-0.18 [-0.32, -0.03]**

Heterogeneity: Tau² = 0.02; Chi² = 13.33, df = 6 (P = 0.04); I² = 55%
Test for overall effect: Z = 2.39 (P = 0.02)

allocation concealment.[11,13,23] When these were removed from the analysis, the effect size increased from −0.18 (95% confidence interval −0.32 to −0.03) to −0.22 (95% confidence interval −0.57 to 0.13) but was no longer statistically significant. There were too few studies to conduct our pre-planned sensitivity analysis for studies in which we imputed data, or harms (see eMethods and eResults in the Supplement).

In an exploratory analysis, we found no difference in outcomes between studies with longer or shorter follow-up (see eResults, eFigure 6 in the Supplement), and the effect seems to last up to six weeks.

Expectation interventions

Twenty-two studies investigated expectation interventions (n = 2732) (Table 1).[10,12,15,16,18–22,24,25,27–29,41–46] All but one had adequate data for pooling[12] and one publication reported three studies.[10] We refer to the separate studies within the same publication in the figures as Benedetti 2003a, Benedetti 2003b, and Benedettie 2003c, and report details of each study individually in eTable 2 within the Supplement. Six studies were carried out in the United States, three in Italy, two in each of Australia, Denmark, Germany, The Netherlands and/or Belgium, and the United Kingdom; and one in each of Hungary, Sweden and China. Most of the studies were conducted in primary care, and the timing of the outcome assessment ranged from immediately after the intervention to six months later. The studies included between 11[10] and 455 patients,[24] with an average of 119 (eTable 2 in the Supplement). Most of the studies were conducted in primary care, and the intervention involved similar verbal messages intended to induce a positive expectation about the outcome in the patient (eTable 3 in the Supplement). All but two of the studies had the same (positive) effect direction.[16,28]
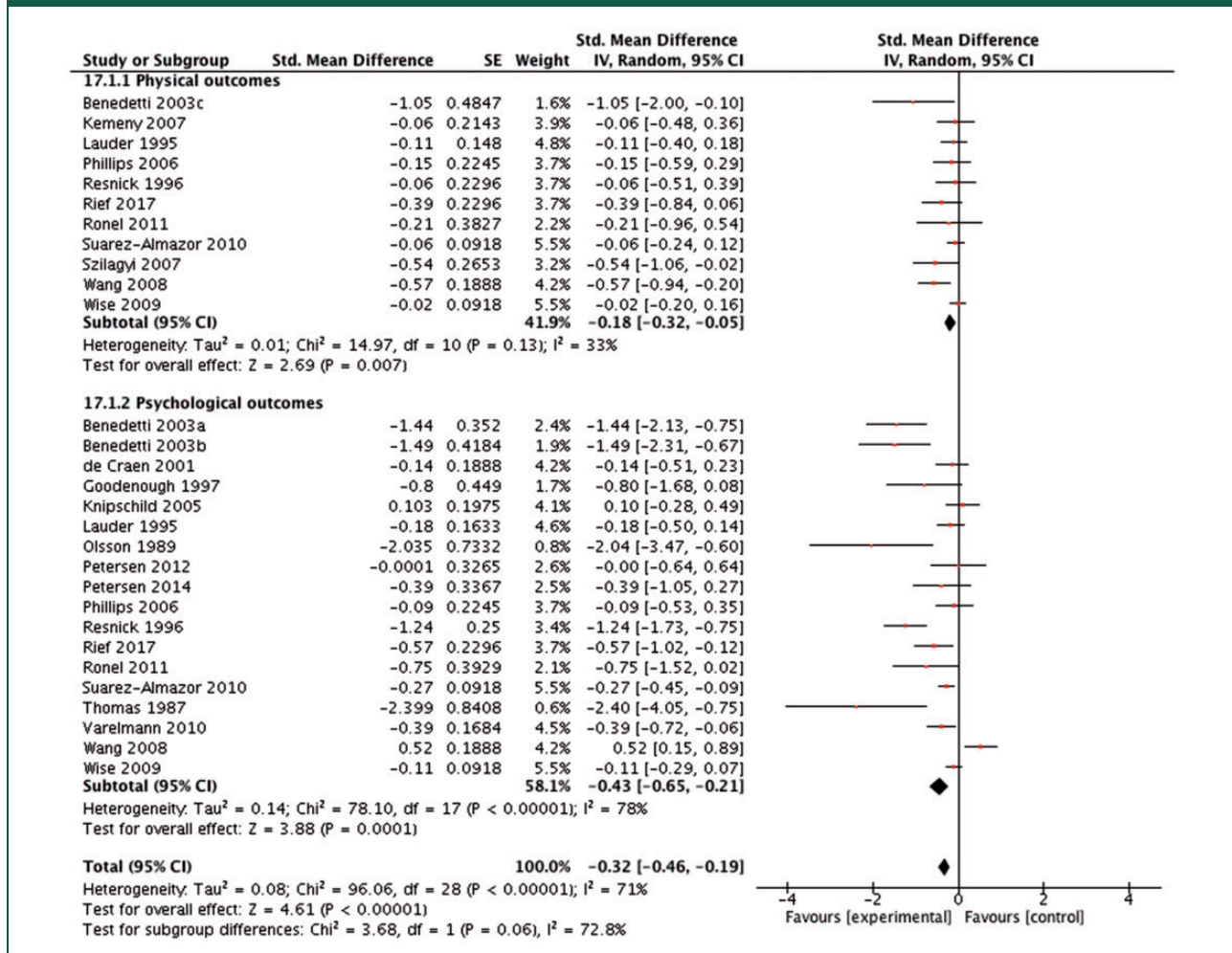
Eleven of the expectation studies (n = 1790) reported the effects of expectations on physical outcomes and showed a significant benefit of expectation interventions (standardised mean difference −0.18 [95% confidence interval −0.32 to −0.05; I² = 33%]) (Figure 2). Outcomes included physical function, artery diameter stenosis and length of stay in hospital (Table 1, eTable 2 in the Supplement). The quality of the evidence was moderate (eTable 4 in the Supplement). Eighteen studies within 17 publications (n = 2014) reported the effects of expectations on psychological outcomes. The effect was statistically significant (standardised mean difference -0.43 [95% confidence interval -0.65 to -0.21; I² = 78%]) (Figure 2). Funnel plots revealed some evidence of publication bias for studies with psychological outcomes, and the quality of the evidence was low (eTable 4 in the Supplement). The effects of expectation interventions with psychological outcomes were tested in pain, anxiety and patient satisfaction.

The effects were positive for all physical outcomes and in all but two of the psychological outcomes.[16,48] The effect was positive but not statistically significant in the study without data eligible for pooling (see eResults in the Supplement).[12]

Eight expectation intervention trials (n = 1492) reported harms, and there was no significant difference in the frequency of harm between intervention groups: odds ratio 1.05 ([95% confidence interval 0.60 to 1.85] I² = 75%, $p = 0.52$) (eFigure 3 in the Supplement). A funnel plot did not reveal evidence of publication bias (see eFigure 2 in the Supplement) and the quality of the evidence was very low (eTable 4 in the Supplement).

For the secondary outcomes, three expectation intervention studies[21,24,29] reported participant assessed quality of life (assessed in different ways, see eMethods in the Supplement). Expectation interventions seemed to slightly improve quality of life (standardised mean difference 0.25 [95% confidence

Figure 2. Effects of expectations interventions.

Study or Subgroup	Std. Mean Difference	SE	Weight	Std. Mean Difference IV, Random, 95% CI
17.1.1 Physical outcomes				
Benedetti 2003c	−1.05	0.4847	1.6%	−1.05 [−2.00, −0.10]
Kemeny 2007	−0.06	0.2143	3.9%	−0.06 [−0.48, 0.36]
Lauder 1995	−0.11	0.148	4.8%	−0.11 [−0.40, 0.18]
Phillips 2006	−0.15	0.2245	3.7%	−0.15 [−0.59, 0.29]
Resnick 1996	−0.06	0.2296	3.7%	−0.06 [−0.51, 0.39]
Rief 2017	−0.39	0.2296	3.7%	−0.39 [−0.84, 0.06]
Ronel 2011	−0.21	0.3827	2.2%	−0.21 [−0.96, 0.54]
Suarez–Almazor 2010	−0.06	0.0918	5.5%	−0.06 [−0.24, 0.12]
Szilagyi 2007	−0.54	0.2653	3.2%	−0.54 [−1.06, −0.02]
Wang 2008	−0.57	0.1888	4.2%	−0.57 [−0.94, −0.20]
Wise 2009	−0.02	0.0918	5.5%	−0.02 [−0.20, 0.16]
Subtotal (95% CI)			41.9%	−0.18 [−0.32, −0.05]
Heterogeneity: Tau² = 0.01; Chi² = 14.97, df = 10 (P = 0.13); I² = 33%				
Test for overall effect: Z = 2.69 (P = 0.007)				
17.1.2 Psychological outcomes				
Benedetti 2003a	−1.44	0.352	2.4%	−1.44 [−2.13, −0.75]
Benedetti 2003b	−1.49	0.4184	1.9%	−1.49 [−2.31, −0.67]
de Craen 2001	−0.14	0.1888	4.2%	−0.14 [−0.51, 0.23]
Goodenough 1997	−0.8	0.449	1.7%	−0.80 [−1.68, 0.08]
Knipschild 2005	0.103	0.1975	4.1%	0.10 [−0.28, 0.49]
Lauder 1995	−0.18	0.1633	4.6%	−0.18 [−0.50, 0.14]
Olsson 1989	−2.035	0.7332	0.8%	−2.04 [−3.47, −0.60]
Petersen 2012	−0.0001	0.3265	2.6%	−0.00 [−0.64, 0.64]
Petersen 2014	−0.39	0.3367	2.5%	−0.39 [−1.05, 0.27]
Phillips 2006	−0.09	0.2245	3.7%	−0.09 [−0.53, 0.35]
Resnick 1996	−1.24	0.25	3.4%	−1.24 [−1.73, −0.75]
Rief 2017	−0.57	0.2296	3.7%	−0.57 [−1.02, −0.12]
Ronel 2011	−0.75	0.3929	2.1%	−0.75 [−1.52, 0.02]
Suarez–Almazor 2010	−0.27	0.0918	5.5%	−0.27 [−0.45, −0.09]
Thomas 1987	−2.399	0.8408	0.6%	−2.40 [−4.05, −0.75]
Varelmann 2010	−0.39	0.1684	4.5%	−0.39 [−0.72, −0.06]
Wang 2008	0.52	0.1888	4.2%	0.52 [0.15, 0.89]
Wise 2009	−0.11	0.0918	5.5%	−0.11 [−0.29, 0.07]
Subtotal (95% CI)			58.1%	−0.43 [−0.65, −0.21]
Heterogeneity: Tau² = 0.14; Chi² = 78.10, df = 17 (P < 0.00001); I² = 78%				
Test for overall effect: Z = 3.88 (P = 0.0001)				
Total (95% CI)			100.0%	−0.32 [−0.46, −0.19]
Heterogeneity: Tau² = 0.08; Chi² = 96.06, df = 28 (P < 0.00001); I² = 71%				
Test for overall effect: Z = 4.61 (P < 0.00001)				
Test for subgroup differences: Chi² = 3.68, df = 1 (P = 0.06), I² = 72.8%				

−4   −2   0   2   4
Favours [experimental]   Favours [control]

interval 0.06 to 0.56; $I^2 = 74\%$]) (eFigure 8 and eTable 4 in the Supplement).

Four studies (n = 924) reported the effects of patient satisfaction using patient-reported scales.[24,28] Patients in the expectation intervention group reported significantly higher satisfaction scores (standardised mean difference 0.60 [95% confidence interval 0.04 to 1.15; $I^2 = 87\%$]) (eFigure 4 in the Supplement). None of the expectation intervention trials reported whether the consultation time was increased.

For our subgroup analysis, 10 expectation studies reported the effects on pain and the effects were moderate (−0.28 [95% confidence interval −0.52 to −0.05; $I^2 = 2\%$]) (eFigure 5 in the Supplement). Within these, five reported effects on acute pain and five reported effects on chronic pain. The effect was greater in acute pain (0.54 [95% confidence interval −1.06 to −0.02]) compared with chronic pain (−0.08

[95% confidence interval −0.23 to −0.06]) (eFigure 9 in the Supplement). The methods for assessing acute and chronic pain were similar (mostly visual analog scales).

For our sensitivity analysis, when five expectation intervention trials with physical outcomes judged to be at a high risk of bias[10,15,25,43,45] were excluded from the analysis, the effect size was reduced from −0.18 (95% confidence interval −0.32 to −0.05) to −0.17 (95% confidence interval −0.35 to −0.00). When the 11 expectation intervention trials with psychological outcomes judged to be at a high risk of bias according to the same criteria were removed from the analysis, the effect size was reduced from −0.43 (95% confidence interval −0.65 to −0.21) to −0.27 (95% confidence interval −0.56 to 0.02). When the expectation intervention studies reporting harms with a high risk of bias were removed, the harms remained similar with the odds ratio changing from

Table 2. Effects of interventions.

	Standardised mean difference (95% confidence interval)	Heterogeneity (I^2)	References
Empathy	−0.18 (−0.32 to −0.03)	55%	11,13,14,17,23,26,30
Expectations	−0.33 (−0.47 to −0.22)	72%	10,12,15,16,18–22,24,25,27–29,41–46
Physical	−0.18 (−0.31 to −0.05)	33%	10,15, 20–22,24,25,28,29,43,45
Psychological	-0.43 (-0.65 to -0.21)	78%	10,16,18–22,24,27–29,41–46
Quality of life	0.29 (0.04 to 0.54)	75%	14,21,24,29
Empathy	0.43 (0.13 to 0.73)	n/a (one study)	14
Expectations	0.25 (−0.06 to 0.56)	80%	21,24,29
Patient satisfaction	0.41 (0.16 to 0.67)	80%	13,16,17,23,24,26,28,44
Empathy	0.26 (−0.02 to 0.54)	67%	13,17,23,26
Expectations	0.60 (0.04 to 1.15)	87%	16,24,28,44
Pain	−0.22 (−0.40, −0.05)	64%	
Empathy	−0.05 (−0.32, 0.22)	61%	11,26,30
Expectations	-0.28 (-0.52 to -0.05)	62%	10,16,18,19,22,24,28,41,42
	odds ratio (95% confidence interval)	**Heterogeneity (I^2)**	**References**
Harms			
Empathy	1.00 (0.40 to 2.48)	84%	11,30
Expectations	1.05 (0.60 to 1.85)	75%	12,14,24,25,28,29,41,43,54

1.19 (95% confidence interval 0.71 to 1.99) to 1.21 (95% confidence interval 0.64 to 2.31). There were too few studies to conduct our pre-planned sensitivity analysis for studies in which we imputed data (see eMethods and eResults in the Supplement).

The effect seemed to last six months, with no difference between studies with longer and shorter follow-up (see eResults, eFigure 6 in the Supplement).

Discussion

Summary of evidence

We found that conveying empathy and inducing positive expectations in healthcare consultations consistently reduce pain and anxiety by a small amount. Positive messages delivered by practitioners also seem to improve some physical outcomes such as bronchial activity in asthmatic patients and physical function in postoperative patients. Some studies also suggest that delivering positive messages can improve patient satisfaction and health-related quality of life. In the most common condition (pain), the effect of both empathy and expectations interventions was equivalent to a 1- to 2-point reduction in pain on a 10-point visual analog scale. These interventions are unlikely to harm patients. In most analyses, the risk of bias was low to moderate, and the quality of the evidence was low.

Strengths and limitations

This is an up-to-date, comprehensive study of an area that patients have stated is important (see eMethods in the Supplement). Other strengths include the use of a published protocol, the use of GRADE to evaluate the overall quality of evidence and a search strategy that identified trials in this conceptually complex area.

A limitation is that there is likely to be overlap between the studies in our review and other studies of interventions that modify the way practitioners communicate. Empathy is related to compassion, self-efficacy, self-hypnosis and motivational interviewing, and any intervention involving patient–practitioner communication may involve some degree of empathy. Also, any intervention aimed at changing the way healthcare practitioners communicate might be expected to convey something about outcomes, which, in the context of treatments, would often be positive. We mitigated this limitation by using an explicit and replicable search strategy identified trials in which empathy and expectations were explicitly manipulated. This marks an important step forward in this conceptually difficult field and can be used as a benchmark for future studies in this area. Another limitation was the variability of interventions, practitioners, patients and conditions, which led to high statistical heterogeneity in most outcomes and was the main factor leading to a low grading of evidence quality.[35] In spite of the high statistical heterogeneity, the effect direction was, with two exceptions, consistent. This justified pooling results and informed our interpretation of the findings. Furthermore, the classification of some outcomes (in addition to pain) as psychological or physical was challenging. To address this limitation we reported conditions and outcomes, and conducted an exploratory analysis comparing subjective with objective outcomes (see Table 1, eFigure 10 in the Supplement).

Also, most trials in our review did not contain sufficient data about how practitioners were trained, what specific behaviours they were trained to change and which behaviours were most effective for improving patient outcomes.[49] Future research addressing this gap is required to optimise implementation of this evidence. Given that the National Institute for Health and Care Excellence (NICE) defines empathy as a component of high-quality care,[50] further research in this area should arguably be a priority.

The trials in this review also did not report potential harms to practitioners, for example due to additional emotional demands. This should be considered in future empathy research. Finally, the cost-effectiveness of empathy and expectations interventions remains to be evaluated.

Comparison with other studies

This is the most up-to-date review of this topic and, unlike in previous studies in this area, we were able to pool results because of consistent effect direction.[35]

Our results complement a related review showing benefits of patient-centred care;[2] empathy may be a precondition for patient-centred decision making.[51] The benefits of empathy and expectations interventions for pain appear to be similar to those of many common pharmacological treatments.[52,53]

Conclusions and implications

Practitioners who take time to enhance how they express empathy and deliver positive messages are likely to bring small improvements to a range of psychological and physical patient conditions, improve overall patient satisfaction with care, without inducing any harm. The effects appear to be similar to those of many common pharmacological treatments for the conditions treated. A clear grasp of the best and most cost-effective approaches to practitioner training in empathic and positive communication is now required to optimise how we implement this evidence.

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