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Abstract

Background: Over recent years there has been criticism within the United Kingdom’s health service regarding a lack of care and compassion, resulting in adverse outcomes for patients. The impact of emotional intelligence in staff on patient health care outcomes has been recently highlighted. Many recruiters now assess emotional intelligence as part of their selection process for health care staff. However, it has been argued that the importance of emotional intelligence in health care has been overestimated.

Objectives: To explore relationships between emotional intelligence in health care professionals, and caring behaviour. To further explore any additional factors related to emotional intelligence that may impact upon caring behaviour.

Design: An integrative review design was used.

Data sources: Psychinfo, Medline, CINAHL Plus, Social Sciences Citation Index, Science Citation Index, and Scopus were searched for studies from 1995 to April 2017.

Review methods: Studies providing quantitative or qualitative exploration of how any healthcare professionals' emotional intelligence is linked to caring in healthcare settings were selected.

Results: Twenty two studies fulfilled the inclusion criteria. Three main types of health care professional were identified: nurses, nurse leaders, and physicians. Results indicated that the emotional intelligence of nurses was related to both physical and emotional caring, but emotional intelligence may be less relevant for nurse leaders and physicians. Age, experience, burnout, and job satisfaction may also be relevant factors for both caring and emotional intelligence.

1 *Conclusions:* This review provides evidence that developing emotional intelligence in nurses
2 may positively impact upon certain caring behaviours, and that there may be differences
3 within groups that warrants further investigation. Understanding more about which aspects of
4 emotional intelligence are most relevant for intervention is important, and directions for
5 further large scale research have been identified.

6 **What is already known about the topic?**

- 7 • Patient outcomes can be improved if health care professionals show care, compassion,
8 and empathy towards their patients.
- 9 • To care for patients effectively, health care professionals need to be well supported
10 and cared for themselves.
- 11 • Emotional intelligence is positively associated with factors including empathy,
12 resilience, social support, job satisfaction, and caring.

13 **What this paper adds**

- 14 • Higher emotional intelligence levels in nurses was associated with improved physical
15 and emotional aspects of caring.
- 16 • Emotional intelligence in nurse leaders and physicians may be less relevant for
17 improving caring behaviours towards patients.
- 18 • Interventions designed to increase emotional intelligence levels in nurses may
19 improve patient outcomes.

20 *Keywords:* Caring; emotional intelligence; integrative review; nurses; nurse-leaders;
21 physicians

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Introduction

Importance of Caring in Health Care

The importance of caring in the nursing profession has long been recognised; *Notes on hospitals* (Nightingale, 1863) highlighted the need for sanitary conditions, warmth, clean air, light in rooms, and a nutritious diet for all patients. Over the last 20 years however, there has been increased emphasis on the need for compassion and empathy in health care professionals, rather than simply tending to a patient’s physical needs (Duffy & Hoskins, 2003; Kerfoot, 1996; Kret, 2011; Williams, 2001). Currently, a holistic view of care is emphasised, highlighting the need for health care professionals to provide physiological, psychological, and emotional care to their patients (Zamanzadeh, Valizadeh, Jasemi, Keogh, & Taleghani, 2015); a shift from *caring for* to *caring about* (McQueen, 2000).

There are many definitions of caring behaviour, with one example from Mosby’s medical dictionary being “*actions characteristic of concern for the well-being of a patient, such as sensitivity, comforting, attentive listening, honesty, and non-judgmental acceptance.*” Caring behaviour has many benefits for patients, including increased satisfaction, psychological wellbeing, and health outcomes (Al-Mailan 2005; Dugan, Weatherly, Girod, Barber, & Tsue, 2014; Meyer, Cecka, & Turkovich, 2006; Willard, 2006). Despite this, over recent years the culture of the UK’s National Health Service (NHS) has been criticised for lacking in care and compassion, sometimes resulting in negative patient outcomes. The Francis Report (2013) highlighted that a lack of basic care and compassion from NHS staff contributed to the failings at Mid Staffordshire Foundation NHS Trust. The subsequent Berwick Review (2013) and Cavendish Review (2013) again underlined the need for improved care within the NHS, and provided recommendations for this.

1 As a response to these reviews, there have been several policy guidelines issued by
2 the government relating to patient care (Department of Health, 2015; NHS England, 2013).
3 Prior to the publication of the Francis Report, the policy document *Compassion in Practice*
4 (Department of Health, 2012), sought to embed a caring culture within the ever-changing
5 NHS. Within this, the *6Cs of nursing* were introduced: care, compassion, competence,
6 communication, courage, and commitment. The vision of this document was to create a
7 culture where these values underpin care provided by all health professionals (Department of
8 Health, 2012).

9 Recent negative reports do not mean that health professionals no longer care; the
10 Francis Report (2013) also highlighted that for patients to receive the best care, staff also
11 need to be cared for, which was often not happening. NHS staff, perhaps in common with
12 health professionals globally (see Burke, Dolan, & Fiksenbaum, 2014; Jourdain & Chênevert,
13 2010), are frequently over-worked and under-supported, which can lead to burnout and
14 compassion fatigue (Aiken, Rafferty, & Sermeus, 2014). Increased emphasis on meeting
15 targets, and excessive administration, means health care professionals may feel they no
16 longer have time to care for their patients (Pearcey, 2010). There are many benefits in caring
17 for staff, including lower staff turnover, improved staff well-being, reduced workplace stress,
18 increased job satisfaction, and ultimately, better care for patients (Boorman, 2009; Lu,
19 Barriball, Zhang, & While, 2012). However, recognising signs of emotional distress in
20 oneself and others is important for interventions to be provided, and the importance of
21 emotional intelligence (EI) in health care has been suggested over recent years (McQueen,
22 2004; Smith, 2017).

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1 **Emotional Intelligence**

2 The term *emotional intelligence* was first coined in 1990 by Salovey and Mayer
3 (1990), to describe a type of intelligence that included the abilities to understand and regulate
4 one's own emotions, and the emotions of others, and to use this understanding to guide one's
5 thinking and actions. Following the publication of *Emotional Intelligence* (Goleman, 1995),
6 EI became popular as a theory, however, it has been criticised as nothing more than a
7 renaming of existing personality constructs (MacCann, Matthews, Zeidner, & Roberts, 2004).
8 Furthermore, disagreement between investigators regarding what EI is has led to confusion
9 and misunderstanding about the concept (Gohm, 2004).

10 Petrides and Furnham (2003) have argued that EI consists of two distinct concepts:
11 (1) as an emotion-related cognitive ability (Caruso, 2008), and (2) as behavioural dispositions
12 and self-perceptions of one's ability to recognise and understand emotions (Petrides, Pita, &
13 Kokkinaki, 2007). These two perspectives have been termed ability EI and trait EI
14 respectively.

15 It has been proposed that ability EI consists of four main abilities: emotional
16 perception and expression; using emotions to influence thinking; emotional understanding;
17 emotional management (Mayer & Salovey, 1997). Ability EI is measured using maximum
18 performance tests, for example, the Mayer-Salovey-Caruso Emotional Intelligence Test
19 (MSCEIT; Mayer, Salovey, & Caruso, 2002), which assess individuals performing at their
20 best in certain conditions, with correctness of responses typically determined by external,
21 predetermined, criteria. Trait EI is considered to be a multifaceted concept consisting of
22 various personality traits, including emotion expression, self-esteem, and stress management.
23 Four overarching factors in trait EI have been suggested: well-being, self-control,
24 emotionality, and sociability (Petrides, 2009), which are typically measured using self-report

1 instruments such as the Trait Emotional Intelligence Questionnaire (TEIQue; Petrides, 2009).
2 Trait EI has been found to account for variance over and above the Big Five personality
3 dimensions of neuroticism, extraversion, openness-to-experience, agreeableness, and
4 conscientiousness (Petrides et al., 2007), suggesting that it is more than a renaming of
5 existing personality constructs.

6 Research supports the idea that trait and ability EI are two distinct concepts (Joseph &
7 Newman, 2010; Van Rooy, Viswesvaran, & Pluta, 2005). Investigations typically find
8 correlations in excess of .30 between ability EI and other tests of cognitive ability, whereas
9 correlations between trait EI and cognitive tests do not generally exceed .10 (Van Rooy et al.,
10 2005). Furthermore, correlations between measures of ability and trait EI have been found to
11 be low (Van Rooy et al., 2005).

12 It has been argued that self-report measures of EI, which are typically used in studies
13 of trait EI, are not representative of actual EI ability (Brackett & Mayer, 2003). However,
14 others have argued that even though an individual may know the correct way to respond to
15 someone emotionally, this does not mean they would necessarily act this way in practice
16 (Brody, 2004). Indeed, contextual factors, such as social support or current stressors, may
17 impact upon how an individual actually behaves. Drawing upon the theory of planned
18 behaviour (Ajzen, 1991), it could be argued that trait EI is an important factor in determining
19 whether one acts in a certain way; if an individual does not believe they have the ability to
20 regulate their emotions, they are perhaps less likely to actually do so. A further argument for
21 overlap of the two constructs is that perception and expression of emotions is influenced by
22 emotional dispositions (King, 1998; Malatesta & Wilson, 1988; Petrides & Furnham, 2003),
23 and Petrides and Furnham point out that all conceptualisations of EI share some common
24 facets, such as *emotional self-awareness*.

1 The debates in this field have given rise to a third level of EI; knowledge
2 (Mikolajczak, Petrides, Coumans, & Luminet, 2009). To illustrate the difference between the
3 three concepts, consider that although an individual may have the knowledge that relaxation
4 is a good technique for stress, in practice, they may not be able to relax when stressed (low
5 ability EI). Furthermore, even if they have the ability to use relaxation, (e.g. doing so
6 successfully when prompted), they may not be predisposed to do so of their own volition
7 (low trait EI).

8 According to Mayer and Salovey (1997), EI focusing on ability, rather than traits, can
9 be increased through learning and experience. Indeed, there is evidence that ability EI can be
10 increased following training programmes (Nelis, Quoidbach, Mikolajczak, & Hansenne,
11 2009; Pool & Qualter, 2012). Learning may not be limited to ability EI however, as Nelis and
12 colleagues found that trait EI scores also increased following the intervention. Within health
13 care settings, an EI intervention for physicians and nurses increased trait EI scores and
14 reduced anxiety (Nooryan, Gasparyan, Sharif, & Zoladl, 2011).

15 **Factors Associated with EI**

16 It seems plausible that individuals who have the ability and disposition to recognise
17 and understand their emotions, and those of others, assert themselves, and attend to emotional
18 self-care, would show certain potentially beneficial characteristics for working in caring
19 professions.

20 Indeed, higher EI has been linked to various factors, including greater psychological
21 adjustment (Ranjha & Shujja, 2010), self-compassion (Şenyuva, Kaya, Işık, & Bodur, 2014),
22 empathy (Ezzatabadi et al., 2012; Mayer, Caruso, & Salovey, 1999), resilience (Schneider,
23 Lyons, & Khazon, 2013), social support (Montes-Berges & Augusto, 2007), job satisfaction
24 (Ezzatabadi et al., 2012; Lorber, 2015) and caring (Kaur, Sambasivan, & Kumar, 2013; Rego,

1 Godinho, McQueen, & Cunha, 2010), whilst lower EI is linked to greater burnout (Gutierrez
2 & Mullen, 2016), and stress (Montes-Berges & Augusto, 2007; Naidoo & Pau, 2008). Many
3 of these factors, such as empathy, social support, resilience, and protection against burnout,
4 may be either directly, or indirectly linked to caring, in that they make it more likely one can
5 continue displaying caring behaviour, even during highly emotive circumstances.

6 **EI in Health Care Professionals**

7 The importance of EI in health care settings therefore seems apparent; if health care
8 professionals higher in EI are more compassionate, empathic, resilient, caring, and able to
9 manage emotions in others, they are more likely to be able to care for themselves, and in turn
10 their patients. Indeed, studies indicate that health care workers want to respond emotionally
11 to their patients (Kooker, Shoultz, & Codier, 2007; Pearcey, 2010). Health organisations are
12 ever-changing, and nursing turnover globally is high (Liu, Goryakin, Maeda, Bruckner, &
13 Scheffler, 2017). Leaders who provide inspiration and maintain motivation, whilst also
14 encouraging creativity and shared ownership, within their workforces is important for staff
15 retention and changing practices. EI has been linked to relational models of leadership, such
16 as transformational leadership, which in turn are related to improved outcomes for patients
17 (Cummings et al., 2010; Spano-Szekely, Quinn Griffin, Clavelle, & Fitzpatrick, 2016).

18 There is increasing emphasis on considering EI when recruiting for caring professions
19 (Carson, Carson, Fontenot, & Burdin Jr., 2005; Harper & Jones-Schenk, 2012; Lyon, Trotter,
20 Holt, Powell, & Roe, 2013). However, others have argued that despite the theoretical support,
21 empirical studies that link the concept of EI and caring behaviours are scarce, and the
22 relevance of EI on caring behaviours may be lower than thought (Akerjordet & Severinsson,
23 2007; Kaur et al., 2013; Rego et al., 2010).

1 caring OR warmth OR sensitiv* OR respect AND nurs* OR midwi* OR doctor OR "health
2 worker" OR physician OR clinician OR psycholog* OR psychiatr* OR "emergency worker"
3 OR "health care professional" OR "health visitor" OR "support worker" OR "health care
4 assistant" OR "care worker" AND hospital OR ward OR inpatient OR acute OR rehabilitat*
5 OR "nursing home" OR "residential home" OR hospice OR outpatient OR community OR
6 "medical cent*."

7 **Study Selection**

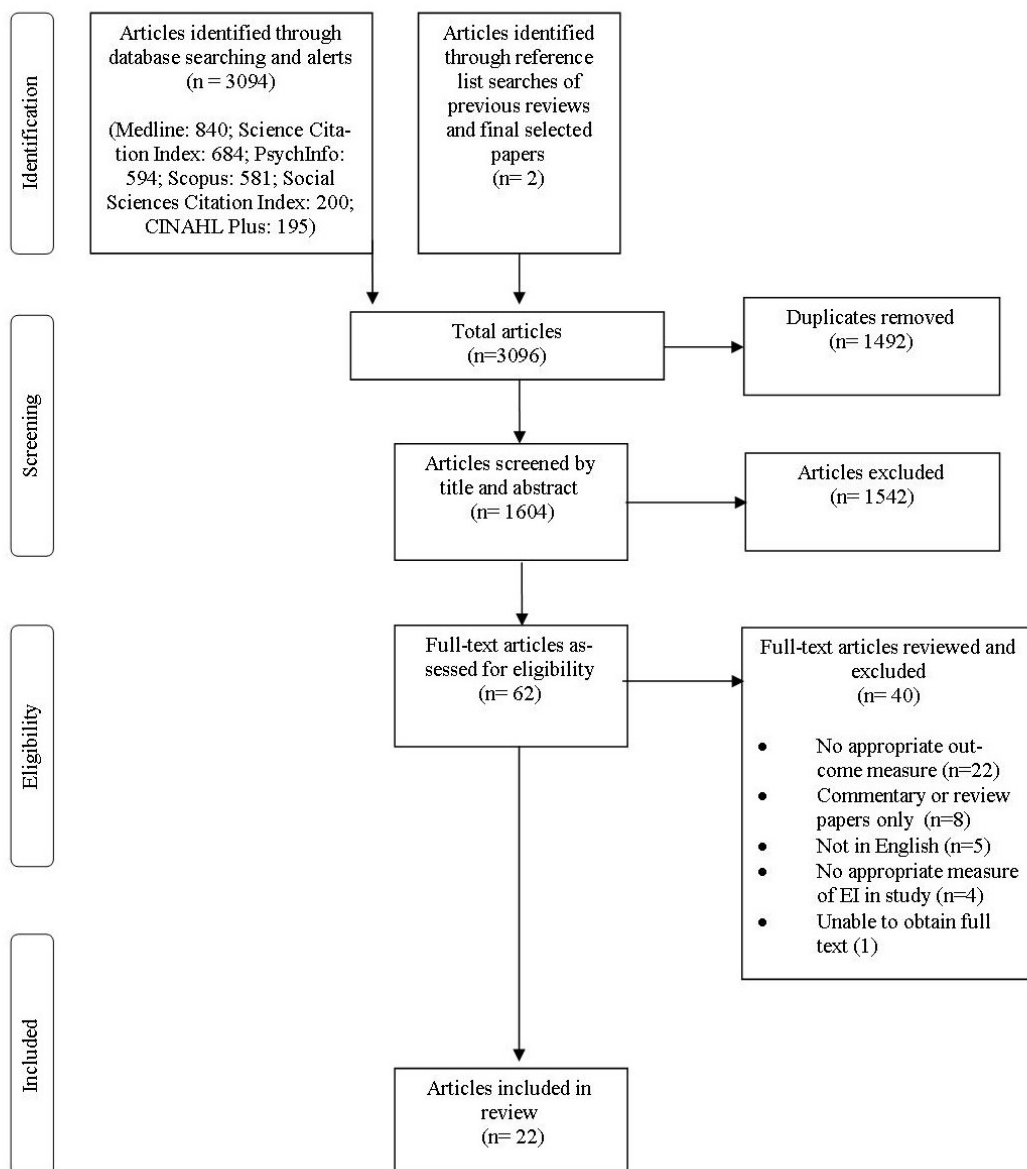
8 The above process resulted in 3096 papers, which were initially screened by title and
9 abstract after duplicates were removed. Following this, 62 full text articles were reviewed
10 using an inclusion screening tool developed for this study. All papers were included provided
11 they were available in English, and met the inclusion criteria of assessing the impact of EI on
12 any outcome related to caring. All health care professionals were included in clinical or long-
13 term health settings. Papers were only included if they had used a valid and standardised
14 measurement of EI. A total of 22 papers met the inclusion criteria and were included in the
15 review, two of which were identified through hand searching of reference lists of included
16 studies. Figure 1 presents the selection process used.

17 **Quality Assessment**

18 There is currently no *gold standard* for quality assessment (Greenhalgh & Brown,
19 2014) in either qualitative or quantitative research. As all studies identified were quantitative
20 in nature, methodological quality was quality assessed using the Newcastle-Ottawa Scale
21 adapted for cross-sectional studies (Herzog et al., 2013).

22 Guidance for completion and interpretation of the Newcastle-Ottawa Scales are
23 available (Wells et al., 1999). This tool has three major components: (1) selection of the

1 groups of study, (2) comparability, (3) assessment of the outcome or exposure. Each
 2 component has individual weightings, and the maximum score is 10 points, which represents
 3 the highest methodological quality. Papers were quality assessed firstly by the primary
 4 researcher and given a rating (see Table 1). A second reviewer then independently checked
 5



6

7 *Figure 1.* PRISMA flow diagram showing the screening and selection of articles for

8 synthesis.

1 the highest methodological quality. Papers were quality assessed firstly by the primary
2 researcher and given a rating (see Table 1). A second reviewer then independently checked
3 the papers against the quality assessment tool, and had similar findings to the primary
4 researcher, with discrepancies occurring 39 times out of a possible 154, generally around
5 comparability and statistical test. These discrepancies were resolved following discussion.

6 For the purpose of this review, thresholds for good, moderate, and poor quality studies
7 were deemed to be scores of ≥ 7 , 5-6, and ≤ 4 respectively. This is in line with previous
8 research (Bowatte et al., 2015). However, it has been argued that relying on total quality
9 scores may be misleading, as some elements of assessment may be more important than
10 others (Greenhalgh & Brown, 2014). Thus, qualitative reporting on the methodological
11 aspects of the studies, rather than reliance on a numerical score is considered more
12 appropriate for systematic reviews and meta-analyses (Juni, Witschi, Bloch, & Egger,
13 1999). The quality of studies ranged, and specific methodological issues are commented on in
14 the results and discussion sections of this review. Poor quality studies were included in order
15 to discuss areas of bias.

16 **Data Extraction**

17 For each included paper, information on the population, design, relevant aims,
18 measures, and main findings were extracted and tabulated (see Table 2). The included studies
19 were scrutinised for data relating to the review questions. Due to the variability of the studies,
20 data were synthesised descriptively, and the relationship between EI and caring behaviour
21 was analysed in a narrative format.

22

Table 1

Quality Assessment Ratings

Study	Selection (maximum 5 points)				Comparability (maximum 2 points)	Outcome (Maximum 3 points)		Total (maximum 10 points)
	Representative of sample	Sample size justified	Details of non-respondents	Valid measurement tool	Other factors controlled for	Assessment of outcome	Statistical test	
Adams & Iseler, (2014)	1	0	0	2	0	2	1	6
Araque, (2015)	1	0	0	2	0	2	1	6
Bamberger et al., (2016)	1	0	0	2	0	2	0	5
Chao, Shih, & Hsu, (2016)	1	0	1	2	2	2	0	8
Codier, Freitas, & Muneno, (2013)	1	0	0	2	0	2	0	5
Dafeeah, Eltohami, & Ghuloum, (2015)	1	0	0	2	2	1	1	7
Dugan et al., (2014)	1	0	0	2	0	2	1	6
Ezzatabadi et al., (2012)	1	0	0	1	2	2	1	7
Kaur et al., (2013)	1	0	0	2	2	2	1	8

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Kaur, Sambasivan, & Kumar, (2015)	1	0	0	2	1	2	1	7
Lorber, (2015)	1	0	0	2	0	1	0	4
Marotta, (2011)	1	1	0	2	0	2	0	6
Munro, (2011)	1	0	0	2	2	2	0	7
Quoidbach & Hansenne, (2009)	1	0	0	2	0	2	0	5
Rego et al., (2010)	0	0	0	2	2	2	0	6
Sommaruga, Casu, Giaquinto, & Gremigni, (2016)	1	0	0	2	1	1	1	6
Sulo, (2014)	1	0	0	2	2	2	1	8
Wagner, Moseley, Grant, Gore, & Owens, (2002)	0	0	0	2	0	2	1	5
Weng, (2008)	0	0	0	2	2	2	0	6
Weng, Chen, Chen, Lu, & Hung, (2008)	0	0	0	2	0	2	0	4
Weng, Chen et al., (2011)	1	0	0	2	2	2	0	7
Weng, Steed et al., (2011)	0	0	0	2	2	2	0	6

Table 2

Study Characteristics and Main Findings

Study author(s)	Design	Population	Relevant aims	EI measurement (<i>ability or trait</i>)	Assessment of caring	Main findings
Adams & Iseler, (2014)	Cross-sectional	Registered nurses (n=361) in United States of America (USA). 92% female.	To explore whether nurses' EI is related to quality of care (QOC), patient satisfaction, and compliance with care (CWC).	MSCEIT. <i>Ability</i>	Assessed five aspects of physical QOC via medical records, and five aspects of CWC. Patient satisfaction assessed via Press Ganey Patient Satisfaction Survey.	EI related to one aspect of CWC, and three aspects of QOC. EI unrelated to patient satisfaction.
Araque, (2015)	Cross-sectional	Registered nurses in USA. (n=30) Majority in 26-35 age range, and 0-5 years experience. 76.7% female.	To explore whether nurses' EI is related to patient satisfaction with care.	MSCEIT. <i>Ability</i>	Assessed patient reported emotional /spiritual care via 10-item Caring Factor Survey (Nelson & Watson, 2012).	EI was related to patient satisfaction with care.
Bamberger et al., (2016)	Prospective, cohort study	Registered nurses (n=10) and physicians (n=17) in Israel.	To explore whether an EI intervention increases EI scores and patient satisfaction with care.	Emotional Quotient Inventory (EQ-i; Bar-On, 1997) <i>Trait</i>	Assessed emotional and physical care via 15-item scale developed by authors.	Post-intervention, physicians' EI, and patient satisfaction with physician care increased significantly. No significant difference found for nurses.
Chao et al., (2016)	Cross-sectional	Non-managerial nurses (n=98) in Taiwan. Majority in 31-40 age range, and 1-3 years experience. 100% female.	To investigate moderating role of EI on relationship between burnout, and patient reported QOC.	Chinese version of the Emotional Intelligence Inventory, (Goleman, 1995). <i>Trait</i>	Assessed patient reported physical and emotional aspects of care via 12-item scale developed by authors.	No effect of EI on burnout or QOC.

Codier et al., (2013)	Mixed method, pre/post-test design.	Registered nurses (n=33) working in Hawaii. Mean age 37, and years experience 9.5.	To explore whether nurses' emotional care of patients increases following an EI intervention.	MSCEIT. <i>Ability</i>	Assessed emotional care via checking for evidence of emotional care planning on patient charts.	Comparisons of pre and post-study patient records showed significant increase in emotional care planning. Unable to say whether EI was related to this though. Insufficient sample size to draw any conclusions.
Dafeeah et al., (2015)	Cross-sectional	Nurses (n=828), physicians (n=99), lab technicians (n=43), working in Qatar. Majority in 30-39 age range, and 10+ years experience. 86.6% female.	To explore whether higher EI results in more compassionate attitudes towards patients with HIV.	Emotional Intelligence Appraisal (EIA; Bradberry & Greaves, 2004). <i>Trait</i>	Assessed nurse /physician self-reported emotional care /compassion via 23-item KHWAR Hospitals' Scale developed by Dafeeah and Eltohami for this study.	Participants with higher EI held more compassionate attitudes towards patients with HIV.
Dugan et al., (2014)	Prospective, longitudinal cohort study	Physician residents working in USA (n=22). Mean age 29. 68% male.	To explore whether an EI intervention increases EI and patient satisfaction with care scores.	EQ-i <i>Trait</i>	Assessed patient reported physical and emotional care via five questions from the Press Ganey Patient Satisfaction Survey.	Post-intervention, both EI scores and patient satisfaction scores had risen significantly.
Ezzatabadi et al., (2012)	Cross-sectional	Nurses working in Iran (n=243). Majority in <30 age range, and married. 86% female.	To explore whether nurses' EI is related to service care quality.	Cyberia-Shrink Emotional Intelligence Questionnaire (Etebarian & Omidpanah, 2008). <i>Ability</i>	Assessed patient reported physical and emotional care via 22-item SERQUAL questionnaire (Parasuraman, Zeithaml, & Berry, 1988).	Higher EI had a direct effect on service quality (including empathy). Job satisfaction had mediating role.

Kaur et al., (2013)	Cross-sectional	Nurses working in Malaysia (n=448). Majority in 20-29 age range, married, and 2-5 years experience. 98% female.	To explore whether nurses' EI is related to caring behaviours and burnout.	Schutte Self-Report Emotional Intelligence Test (SSEIT; Schutte et al., 1998). <i>Trait</i> ¹	Assessed physical and emotional care self-reported by nurses via the 24-item Caring Behaviours Inventory (Wu, Larrabee, & Putman, 2006). To validate nurses' responses, patient reported general care was assessed via three-item questionnaire.	Higher EI was related to greater caring behaviours, greater psychological ownership, and reduced burnout.
Kaur et al., (2015)	Cross-sectional	Nurses working in Malaysia (n=448). Majority in 20-29 age range, married, and 2-5 years experience. 98% female.	To explore whether EI has a positive relationship with caring behaviour, and what aspects of EI are most important.	SSEIT. <i>Trait</i>	As above.	Higher EI (managing own emotions) was related to greater caring behaviours (respectful deference to others and assurance of human presence).
Lorber, (2015)	Cross-sectional	Nurses (n=413) and nurse leaders (n=96) working in Slovenia. Mean age of nurses 38, and leaders 43.5. Leaders had mean of 10.1 years in leadership role, nurses had mean of 16.5 years experience. 98% female.	To explore whether nurse leaders' EI is related to quality of care in their unit.	Trait Emotional Intelligence Questionnaire (TEIQue). <i>Trait</i>	Assessed care self-reported by nurses and nurse leaders via a nine-item questionnaire developed for the study. Unclear whether physical or emotional care assessed.	Nurse leaders' EI (self-reported and by employees) was related to quality of care in their unit.
Marotta, (2011)	Cross-sectional	Nurse leaders -Nursing home administrators (NHAs; n=173) directors of nursing (DONs; n=95) in USA.	To explore relationships between EI in NHAs and DONs, and patient care quality.	MSCEIT. <i>Ability</i>	Assessed physical care via medical database. Assessed patient satisfaction with general	No relationship found between EI in nurse leaders and patient QOC. Lower scores for

¹ Although it is based on an ability EI model, the Schutte Emotional Intelligence Test is self-report and referred to in the literature as a measure of trait EI.

		Majority in 40-49 age range, and 1-5 years experience. 76% female.			care via 26-item customer satisfaction survey.	perceiving and understanding emotions as a group. But, QOC feedback may not relate to leaders, as most had been in post for less than two years.
Munro, (2011)	Cross-sectional	Nurse managers (NMs; n=38) and registered nurses (RNs; n=659) in USA. Mean age of NMs 51 years, and RNs 41 years. Majority of NMs and RNs married. Mean years experience of NMs 23 years, and RNs 13 years. 92% female for both groups.	To explore whether the EI of NMs is related to QOC, and patient satisfaction, and whether RN job satisfaction affects relationships found.	MSCEIT. <i>Ability</i>	Assessed three aspects of physical care via medical records. Assessed patient reported satisfaction with general care via two-item inpatient survey developed by Avatar International.	EI was positively related to patient satisfaction, but not to QOC or RN job satisfaction.
Quoidbach & Hansenne, (2009)	Cross-sectional	Nurses, auxiliary nurses, and physiotherapists (n=421) in Belgium.	Team EI will be related to quality of health care.	SSEIT. <i>Trait</i>	Assessed team physical care via undercover observers looking for 33 objective criteria. No patient responses sought.	One EI factor (optimism/mood regulation) positively related to quality of health care. One EI factor (appraisal of emotions) negatively related to quality of health care.
Rego et al., (2010)	Cross-sectional	Nurses (n=120) in Portugal. Mean age 32. 75% female.	To explore how six dimensions of EI relate to caring behaviours.	Rego & Fernandes Emotional Intelligence Scale (Rego & Fernandes, 2005). <i>Trait</i>	Assessed patient reported general and emotional care via nine-item questionnaire developed for the study.	Overall EI predicted caring behaviour, but some unusual interactions.

Sommaruga et al., (2016)	Cross-sectional	Nurses (n=128), physiotherapists (n=81), physicians (n=69), nursing assistants (n=40), in Italy. Mean age 43, 70% female.	To investigate whether EI is related to self-perceptions of patient-centred care.	SSEIT. <i>Trait</i>	Assessed four aspects of patient-centred general and emotional care via the 16-item Patient-Provider Relationship Questionnaire (PPRQ; Gremigni, Casu, & Sommaruga, 2016).	EI had direct effects on three aspects of patient-centred care.
Sulo, (2014)	Cross-sectional	Nurse managers (n=24) in USA. Mean age 48, mean years experience as nurse 23. 96% female.	To explore whether nurse managers' EI is related to patient satisfaction with care.	MSCEIT. <i>Ability</i>	Assessed patient reported general and emotional care via four questions from the Hospital CAHPS- your care from nurses.	No significant relationship with total scores, but significant negative relationship between EI and individual satisfaction scores.
Wagner et al., (2002)	Cross-sectional	Physicians (n=30) in USA. Mean age 38. 60% male.	To explore whether EI is correlated with patient satisfaction with care.	EQ-i. <i>Trait</i>	Assessed patient reported general and emotional care via eight-item satisfaction survey.	Limited support, only area of EI to positively correlate with patient satisfaction was <i>happiness</i> .
Weng, (2008)	Cross-sectional	Physicians (n=39) in Taiwan. Mean age 42. 90% male.	To explore whether EI is related to patient trust, and whether patient trust is related to patient satisfaction with care.	Wong and Law EI Scale (WLEIS; Law, Wong, & Song, 2004). <i>Trait</i>	Assessed patient reported general care via two questions derived from Patient Satisfaction Questionnaire (Ware, Snyder, Wright, & Davies, 1983).	Only nurse director rated EI was related to trust, which in turn was related to patient satisfaction via the mediator of patient-physician relationship.
Weng et al., (2008)	Cross-sectional	Physicians (n=39) in Taiwan. Mean age 42. 90% male.	To explore whether EI is related to satisfaction with physician's care.	WLEIS. <i>Trait</i>	As above	No relationship between self-reported EI and satisfaction with physician's care.

Weng, Chen, et al., (2011)	Cross-sectional	Internists (n=110) and surgeons (n=101) in Taiwan. Mean age 42. Overall 98.5% male.	To explore relationships between EI, health care climate, patient trust in care provided, and QOC.	WLEIS. <i>Trait</i>	Assessed physical and emotional care via observers using the six-item Health Care Climate Questionnaire (Williams, Freedman, & Deci, 1998). Assessed patient reported general care via two-item questionnaire derived from Patient Satisfaction Questionnaire (Ware et al., 1983).	Nurse director rated EI of physicians was related to patient trust in care provided. Findings related to QOC not mentioned.
Weng, Steed, et al., (2011)	Cross-sectional	Surgeons (n=50) in Taiwan. Mean age 43. 97% male.	To explore relationships between EI, empathy, patient-surgeon relationship, and patient satisfaction with care.	WLEIS. <i>Trait</i>	Assessed patient reported general care via two-item questionnaire derived from Patient Satisfaction Questionnaire (Ware et al., 1983).	EI had positive relationship with patient-surgeon relationship, and patient satisfaction with care pre-surgery only. No significant relationship between EI and empathy.

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Results

Study Characteristics

Twenty two studies met the inclusion criteria. The dates published of these ranged from 2002 to 2016, and the majority (82%) had been published or written after 2010. Eighteen studies were published in peer reviewed journals, and four (Araque, 2015; Marotta, 2011; Munro, 2011; Sulo, 2014) were unpublished doctoral theses. The EI of nurses was explored in nine studies (41%), physicians in six studies (27%), nurse leaders in four studies (18%), and both physicians and nurses in three studies (14%). The six studies assessing EI in physicians had mostly male participants, 13 studies (59%) had mostly female, and three did not describe demographics. The majority of studies assessed trait EI (68%). Studies were conducted across a range of countries, with the majority in the USA (36%). Other countries were Belgium, Iran, Israel, Italy, Malaysia, Portugal, Qatar, Slovenia, and Taiwan.

On two occasions two separate papers were published using the same participant sample (Kaur et al., 2013; Kaur et al., 2015; Weng, 2008; Weng et al., 2008). However, all four papers were retained, as each paper contributed something different in meeting the aims of this review.

Quality Assessment

Eight studies were deemed good quality, 12 moderate quality, and only two studies poor quality. As mentioned, studies that receive higher scores may still be open to bias, and there were several methodological problems that were common across the studies reviewed. Only one study provided justification of sample size recruited (Marotta, 2011), and Table 1 shows that nine studies had very small sample sizes (<40 participants). Appropriate statistical

1 tests were only used in 45% of studies, with the most common weaknesses being no mention
2 of confidence intervals, and no adjustment made to p-values to account for multiple analyses.

3 Chao et al., (2016), were the only authors to receive a point for response rate. This
4 was awarded because they reported receiving a 100% response rate, however, they did not
5 report on how this was achieved.

6 Despite the fact that all studies used a valid measurement tool for EI, this cannot be
7 classed as an overall strength, being part of the inclusion criteria. Common strengths included
8 over half the studies (55%) controlling for additional factors, such as age, years of
9 experience, or job satisfaction. Nearly all received maximum points for assessment of
10 outcome, by either using patient reports or observations, making these more objective
11 measures. Only three studies assessed care by self-report methods (Dafeeah et al., 2015;
12 Lorber, 2015; Sommaruga et al., 2016). Despite not being specifically included on the quality
13 assessment tool, it is notable that the methods and measures used to assess care varied
14 considerably, from validated measures with several items (Araque, 2015), to non-validated
15 measures asking only two questions (Weng, 2008).

16 Table 1 shows that seventeen studies (77%) received a point for representativeness of
17 sample, although only two of these were classed as truly representative of the target
18 population (Chao et al., 2016; Weng, Chen, et al., 2011). The remaining fifteen were classed
19 as somewhat representative, using non-random sampling.

20 **Relationships between EI and Caring Behaviour in Health Care Professionals**

21 **Nurses.** This review found evidence that both ability and trait EI were related to
22 caring behaviours in nurses (Adams & Isler, 2014; Araque, 2015; Dafeeah et al., 2015;
23 Ezzatabadi et al., 2012; Kaur et al., 2013; Kaur et al., 2015; Rego et al., 2010; Sommaruga et

1 al., 2016). Table 2 shows that care was assessed in a variety of ways, including physical
2 /general care (Adams & Iseler, 2014; Kaur et al., 2013; Kaur et al., 2015), emotional care
3 (Araque, 2015; Dafeeah et al., 2015), and both aspects (Ezzatabadi et al., 2012; Rego et al.,
4 2010; Sommaruga et al., 2016). As noted, the two separate studies by Kaur and colleagues
5 used the same participant group, meaning it is more accurate to surmise that seven studies
6 found an effect.

7 Four of these studies received quality assessment ratings of seven or above, initially
8 suggesting robust evidence. Caution must be used however, as two of these did not link
9 patient reports of care to the EI of the actual nurse who had treated them (Kaur et al., 2013;
10 Kaur et al., 2015), care was self-reported by nurses (Dafeeah et al., 2015), or it was unclear
11 whether patient respondents had been cared for by the participating nurse (Ezzatabadi et al.,
12 2012). Despite receiving slightly lower quality ratings, the papers by Araque (2015), and
13 Rego et al., (2010), arguably provide a more accurate view, as patient respondents here had
14 been cared for by the participating nurse. The small sample size in Araque's study limits any
15 conclusions drawn however.

16 Nurses' ability EI was found correlated to three aspects of physical care; rates of
17 clostridium-difficile infections, methicillin-resistant staphylococcus aureus (MRSA), and
18 patient falls with injury (Adams & Iseler, 2014). Caution must be taken with drawing
19 interpretations, as quality of care ratings were not linked to the EI of nurse participants. Thus,
20 it is possible that patients who had contracted infections, or suffered falls, were not cared for
21 by the nurse participating in this study.

22 Two studies revealed inconclusive evidence for relationships between nurse EI and
23 caring (Codier et al., 2013; Quoidbach & Hansenne, 2009). The sample size in Codier and
24 colleagues' study, which was designed to increase ability EI levels, was too small to allow for

1 statistical analysis to test whether the increase in emotional care planning was linked to an
2 increase in EI scores. Quoidbach and Hansenne found that one aspect of EI, *optimism*, was
3 positively related to quality of care, whereas *appraisal of emotions* was negatively related to
4 quality of care. Furthermore, Codier and colleagues did not demonstrate that reports of care
5 were linked to the EI of nurse participants, and Quoidbach and Hansenne did not seek patient
6 views.

7 Two studies reviewed provided evidence against a relationship between nurse EI and
8 caring (Bamberger et al., 2016; Chao et al., 2016). The first study had a very small sample
9 size however, meaning results may not be generalisable to wider populations. The latter study
10 had a good quality assessment rating, and patient reports of care were linked to the EI of the
11 health professional who had cared for them.

12 **Nurse leaders.** There was little evidence that the EI of nurse leaders was related to
13 patient care. Only one study found a relationship, with nurse leader's trait EI being positively
14 correlated to patient care within their unit (Lorber, 2015). There were several methodological
15 problems with this study however, in particular, that care was assessed via self-reports from
16 nurses, and nurse leaders. One study found no relationship between nurse leader ability EI
17 and patient care quality (Marotta, 2011), whilst Sulo (2014), suggested that ability EI may be
18 detrimental to care. However, despite an overall higher quality rating, Sulo had a very small
19 sample size, meaning results may not be generalisable to other nurse leaders.

20 Munro (2011) offered inconclusive evidence, in that nurse leader ability EI was not
21 related to rates of falls, medication errors, or pressure ulcers, but was positively correlated to
22 patient reported satisfaction with care. Again, only a small sample of nurse leaders was used,
23 so caution must be taken with any conclusions.

1 **Physicians.** As with nurse leaders, the evidence linking physician EI to caring was
2 inconclusive. Four studies suggested there was a relationship between physician trait EI and
3 caring (Bamberger et al., 2016; Dafeeah et al., 2015; Dugan et al., 2014; Sommaruga et al.,
4 2016). Whilst care was self-reported by health care professionals in two studies (Dafeeah et
5 al., 2015; Sommaruga et al., 2016), two studies linked patient reports of care to the EI of the
6 physician who had cared for them (Bamberger et al., 2016; Dugan et al., 2014). The small
7 sample sizes in these latter studies limits any conclusions drawn however.

8 A further two studies provided inconclusive evidence (Weng, Chen, et al., 2011;
9 Weng, Steed, et al., 2011). Both studies linked patient responses to the trait EI of the health
10 professional who had cared for them, however, the former study then made no mention of
11 whether trait EI was directly related to quality of care. In both studies, patient reported care
12 was assessed using only two items. Weng, Steed and colleagues found that physician trait EI
13 was related to patient satisfaction with care at only one time point, and there was no
14 relationship between trait EI and empathy. Of note is the fact that Weng, Chen and colleagues
15 asked nurse directors to assess the trait EI of physicians, as they argued that nurse directors
16 would have a more accurate view of trait EI than the physicians themselves.

17 Other evidence suggested there was no direct relationship between physician trait EI
18 and patient satisfaction with care (Wagner et al., 2002; Weng, 2008; Weng et al., 2008),
19 however, these three studies had several methodological issues, including no mention of
20 sampling strategy, and small sample sizes. Of note is the fact that although the studies did
21 link patient responses to physician participants, the two studies by Weng, and Weng and
22 colleagues, used the same group of participants. As above, Weng used nurse director
23 assessments of physician trait EI. In a further study, Weng and colleagues also used
24 physician self-reported trait EI scores, which revealed no effect, however, patient satisfaction
25 with care was measured with only two items.

1 **Other Relevant Factors for Caring Linked to EI**

2 There is evidence that years of experience may be relevant to EI and caring. Five
3 studies found that EI increased with experience (Chao et al., 2016; Dafeeah et al., 2015; Kaur
4 et al., 2015; Weng, Chen, et al., 2008; Weng, Steed, et al., 2011), but not necessarily that
5 experience directly increased care (Chao et al., 2016). However, Chao and colleagues
6 reported a moderating effect of experience in the relationship between burnout and caring;
7 experienced nurses encountering burnout did not report any deterioration in care, whereas
8 inexperienced nurses did. Furthermore, Dafeeah and colleagues found that experience was a
9 significant predictor of more compassionate attitudes towards patients, whilst Kaur and
10 colleagues also found that experience was related to caring behaviour. Conflicting evidence
11 was reported by Sulo (2014), who found no significant relationship between experience and
12 EI.

13 Linked to experience, age may be another relevant factor (Dafeeah et al., 2015; Rego
14 et al., 2010; Weng, 2008; Weng, Chen, et al., 2008), with these studies providing evidence
15 that EI, or aspects of it, such as understanding of own and others' emotions, and emotional
16 self-control, may increase with age. Empathy however, was negatively related to age in Rego
17 and colleagues study, and Sulo (2014), found no significant relationship between age and EI.
18 Furthermore, Dafeeah and colleagues found no relationship between age and compassionate
19 attitudes towards patients with HIV.

20 There was conflicting evidence for the importance of burnout; Kaur et al. (2013)
21 found that burnout mediated the relationship between EI and care, with nurses higher in EI
22 experiencing less burnout, and increased burnout being associated with poorer care, however,
23 Chao et al. (2016) found no relationship between burnout and care.

1 being able to manage emotions, for example, *I become angry when others criticise me – even*
2 *if I feel that they are right*. Being able to manage one’s emotions is likely to be beneficial for
3 health care professionals, who may experience frequent emotive situations. Being able to
4 remain calm and empathic, and contain their patients’ distress, may influence how caring that
5 person is perceived, as well as allowing them to maintain clarity of thought, thus potentially
6 resulting in fewer errors regarding physical care.

7 There is a paucity of research into whether specific aspects of EI are more important
8 than others. Recently, evidence is emerging that supports the findings of this review, in that
9 managing emotions may be particularly relevant for improving patient outcomes (McColl-
10 Kennedy et al., 2017). Other aspects of EI, such as empathy may be detrimental to staff well-
11 being under certain circumstances, which could impact upon patient care (Sheen, Spiby, &
12 Slade, 2015). There is also evidence within business that EI subfactors have greater
13 predictive power than global scores (Reid, 2009). Collectively, these findings provide
14 tentative evidence that focussing upon global EI scores may be less informative, although
15 further research exploring this is needed.

16 Only two studies found no evidence for nurses’ trait EI being related to emotional or
17 physical care (Bamberger et al., 2016; Chao et al., 2016). One pertinent reason for this is that
18 the authors in both papers noted their sample sizes may have lacked sufficient power to find
19 an effect of trait EI. Other possible reasons include the fact that in the study by Chao and
20 colleagues, nearly half (48%) of nurses were contract employees. Contract nurses generally
21 do not receive the same benefits that permanent nurses do, and can experience higher levels
22 of stress and burnout (Chao et al., 2016; Rezaei, Naderi, Mahmoudi, Rezaei, & Hashemian,
23 2015). Only one of the above studies commented on whether nurses were permanent or not
24 (Adams & Isler, 2014), therefore, it is possible that there may be differences in EI between
25 contract and permanent nurses that affected results found. Furthermore, whilst it is noted that

1 studies were undertaken with nurses from a range of countries and cultures, Chao and
2 colleagues recruited nurses from Taiwan. Four further papers used population groups from
3 Taiwan (Weng, 2008; Weng et al., 2008; Weng, Cheng et al., 2011; Weng, Steed et al., 2011)
4 and these studies also found either limited or no evidence for a relationship between health
5 professional trait EI and caring behaviour. Thus, it is plausible that cultural differences may
6 have affected the non-significant results found.

7 There was no evidence that nurse leader ability EI was related to patient care. Whilst
8 one paper found that nurse leader trait EI was related to care (Lorber, 2015), there were
9 fundamental methodological problems with this study (see Table 1), meaning caution must be
10 taken with any interpretations. Nevertheless, these results could be explained by differences
11 between ability and trait EI. Ability EI is thought to be related to actual EI ability, whereas
12 trait EI may more reflect personality traits (Mayer & Salovey, 1997; Petrides et al., 2007).
13 Thus, as nurse leaders did not actually provide the care to patient respondents, their abilities
14 may be less relevant, and perhaps indicate that the EI of the person actually providing the
15 care is more important. The positive findings for trait EI perhaps suggest that certain
16 personality traits may be helpful for leaders to possess, and may have an indirect impact on
17 patient care via the nurses under the leader who are providing the actual care. Indeed, nurse
18 leaders who have relationally focused leadership styles, such as transformational leadership,
19 are more likely to understand staff needs, and provide support, development opportunities,
20 motivation, and encouragement. In turn, this leads to more positive outcomes, including
21 increased staff satisfaction, well-being, and team effectiveness (Cummings et al., 2010). Trait
22 EI was found more strongly related to transformational leadership than ability EI in a meta-
23 analysis (Harms & Credé, 2010), which supports the view that certain personality
24 characteristics are advantageous for nurse leaders.

1 The negative directionality in Sulo's (2014) study was surprising, and suggested that
2 nurse leaders' ability EI may be detrimental to patient care. The above caveat of nurse leaders
3 not providing actual care must, however, be considered, as must the fact that ability EI may
4 be less relevant for relational leadership styles, and the small sample size (n=24). A further
5 consideration is that when factor scores were examined, the only statistically significant
6 relationship to emerge was between *using emotions* and patient care. It may be that the nurse
7 leaders in this study did not use their emotions in a way that positively affected patient care,
8 perhaps by suppressing them in difficult or stressful situations.

9 There was similarly no evidence that physician ability EI was related to patient care,
10 as all studies involving physicians assessed trait EI. Four studies found that physician trait EI
11 was related to patient care (Bamberger et al., 2016; Dafeeah et al., 2015; Dugan et al., 2014;
12 Sommaruga et al., 2016), but all of these studies had fundamental methodological problems,
13 and none explored whether specific aspects of trait EI were more important. A further five
14 papers provided inconclusive or no evidence for a relationship between physician trait EI and
15 caring (Wagner et al., 2002; Weng, 2008; Weng et al., 2008; Weng, Chen, et al., 2011;
16 Weng, Steed, et al., 2011).

17 It may be that some physicians view being too in touch with others' emotions as
18 distracting from the medical care they need to provide, and a recent study found *creating*
19 *inner distance by taking an observer perspective* was described as a strategy for resilience by
20 40% of surgeons (Zwack & Schweitzer, 2013). An investigation of physician neurological
21 responses to patients' physical pain found reduced activation in the areas of the brain
22 associated with feeling pain, whilst the areas of the brain involved in self-regulation were
23 activated (Decety, Yang, & Cheng, 2010). Whilst a level of neutrality may be adaptive for
24 both patients and physicians in some circumstances, a lack of personalised care by some

1 medical staff was highlighted recently in the *hello, my name is* campaign started by Dr. Kate
2 Granger (Ford, 2015).

3 Notably, most of the studies assessing physician EI had mainly male participants. The
4 only studies to have more female participants overall were Sommaruga et al. (2016), and
5 Dafeeah et al. (2015), who both also assessed the EI of nurses. No breakdown on gender
6 between nurses and physicians was provided, thus, it is plausible that the lack of relationship
7 found between physician EI and caring may be attributable to gender differences rather than
8 job role.

9 A further consideration is that all of the studies exploring physician trait EI and caring
10 had methodological problems, including sample sizes <40 (Bamberger et al., 2016; Dugan et
11 al., 2014; Wagner et al., 2002; Weng, 2008; Weng et al., 2008), using physician self-reports
12 of care (Dafeeah et al., 2015; Sommaruga et al., 2016), and inappropriate or incomplete
13 statistical tests (Bamberger et al., 2016; Weng, 2008; Weng et al., 2008, Weng, Cheng, et al.,
14 2011; Weng, Steed, et al., 2011).

15 **Limitations**

16 Findings from the studies reviewed generally gave no indication of response rate
17 (n=21); no justification of, and /or inadequate, sample size (n=21); and incomplete
18 /inappropriate statistical tests (n= 12). These methodological issues limit the generalisability
19 of findings. The majority (n=19) of the studies were cross-sectional, meaning causal
20 relationships were unable to be drawn.

21 The assessment of caring varied considerably across studies, with caring being
22 typically ill-defined. No study investigated whether there were differences between general,
23 physical, or emotional care, and care was sometimes assessed using only two items. Twelve

1 studies either did not seek patient views of care, or did not link patient responses to the EI of
2 the health care professional who cared for them (or this was unclear), thus providing less
3 reliable conclusions.

4 One limitation of the review was to include only studies published in English. There
5 may be relevant literature published in other languages that were not accessed, as translation
6 was unavailable. Furthermore, although the selection process was carried out using a
7 systematic approach, included studies were identified by one researcher. Ideally, at least two
8 researchers should have carried out this procedure to minimise bias.

9 Lastly, it was difficult to determine any clear conclusions about the impact of EI on
10 caring in health care professionals, as the studies reviewed were so heterogeneous. Due to the
11 relatively large number of papers identified, it may have been more advantageous to have
12 focussed this review on a specific group, e.g. nurses, as this may have allowed for greater
13 exploration within this group. Undertaking a review on health care professionals in general
14 however, has provided tentative evidence that there may be differences within groups that
15 warrant further investigation, and directions for future research are described below.

16 **Directions for Future Research**

17 Further large scale research exploring the relationship between health professional EI
18 and validated measures of both emotional and physical care separately would be useful, to
19 see if EI is more relevant for particular aspects of care. For example, one hypothesis may be
20 that being more in touch with emotions increases empathy for patients, which is beneficial for
21 emotional care, but potentially distracting, thus resulting in mistakes to physical aspects of
22 care (e.g. medication errors) being made. Additionally, it would be useful to understand more
23 about which specific aspects of EI are most relevant, as interventions could then be tailored
24 towards developing these aspects. Future studies should ensure the views of the patients

1 being cared for by the participating health professionals are sought. Obtaining the views of
2 more than one recipient of care would also be more meaningful.

3 It would be useful to explore in more detail whether there are differences between
4 nurses and physicians, and gender. The only studies to include both types of health care
5 professional were Bamberger et al. (2016), Dafeeah et al. (2015), and Sommaruga et al.
6 (2016). The latter two studies were heavily weighted towards nurses, making meaningful
7 comparisons difficult. The available evidence suggested that physician EI was largely
8 unrelated to caring, although further research testing for gender differences in physicians
9 would help determine whether the lack of relationship found is a result of job role, or gender.
10 Future research should also explore the importance of EI in different nursing roles. Nurses
11 are not a homogeneous group, and it could be that EI skills are more important in long-term
12 care settings than in units where care is very transient, such as accident and emergency
13 wards.

14 Longitudinal studies, with large sample sizes, would be useful to determine the
15 effectiveness of EI interventions. This would enable conclusions to be drawn about whether
16 increases in patient care are related to increases in EI in health care professionals. They
17 would also provide further evidence to the efficacy of EI interventions.

18 Very few studies were conducted in Europe, and none were set in the UK. Research
19 involving health professionals working within the NHS would be useful to see if findings
20 translate to this population.

21 **Implications for Health Care Professionals and Services**

22 These findings have several implications for health care professionals and services.
23 The available evidence suggests that there is a relationship between both ability and trait EI

1 and caring in nurses. Whilst no causal relationships were established, it may be helpful for
2 health services to consider EI level when recruiting nurses, particularly in settings where it
3 has been established EI skills are beneficial. Furthermore, health services may also consider
4 implementing training programmes focused on developing EI skills, as there is evidence both
5 ability and trait EI can be increased via interventions (Nelis et al., 2009; Nooryan et al., 2011;
6 Pool & Qualter, 2012). This may result in beneficial outcomes for both nurses and patients.
7 Whilst there is tentative evidence that improving emotion management may be particularly
8 useful to improve healthcare outcomes, the majority of the current literature utilises global EI
9 scores, and until further research is completed it may be more prudent to focus upon
10 improving general EI. Furthermore, the implications for nurse leaders and physicians are less
11 clear, and it may not be an effective use of resources implementing interventions to increase
12 EI within these populations if the desired outcome is to increase caring.

13 **Conclusions**

14 This review found evidence that the EI of nurses is related to caring behaviours, and
15 interventions to develop EI skills in nurses may have benefits for both staff and patients. The
16 evidence that the EI of nurse leaders and physicians is related to caring behaviours is less
17 clear. The review's findings however, must be considered in light of the limitations
18 mentioned, and interpreted tentatively. High quality future research is necessary to further
19 inform the evidence base, and enable future systematic reviews focusing on specific areas of
20 EI and caring to be undertaken.

21 *Conflict of interest:* None.

22 *Funding:* This research did not receive any specific grant from funding agencies in the
23 public, commercial, or not-for-profit sectors.

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