Table 1. Search strategy

|  |  |  |  |
| --- | --- | --- | --- |
| Database | Main search | Additional keywords | Limitations |
| Medline | compassion\* OR empath\* OR Empathy1 OR person centered care  OR person centred care OR relationship centered care OR relationship centred care OR client centered care OR client centred care OR Patient-Centered Care1 OR  Patient centered care OR patient centred care OR dignity | AND randomized controlled trial OR randomized controlled trial OR evaluation OR Nursing Evaluation Research1 OR quasi experiment OR controlled trial OR time series OR Controlled Before-After Studies1 OR before and after OR Comparative Study1  AND nurs\* OR Occupational Groups1 | English |
| CINAHL | compassion\* OR empath\* OR Empathy2 OR person centered care  OR person centred care OR relationship centered care OR relationship centred care OR client centered care OR client centred care OR Patient-Centered Care2 OR  Patient centered care OR patient centred care OR dignity OR Human Dignity2 | AND randomized controlled trial OR Randomized Controlled Trial2 OR Evaluation2 OR evaluation OR quasi experiment OR controlled trial OR time series OR Time Series2 OR Controlled Before-After Studies2 OR before and after OR Comparative Studies2 OR comparative study AND Nurses2 OR nurs\* OR occupational groups | English, excluded Medline records |
| Cochrane | Same search terms as above | Same search terms as above | English |
|  | | | |

1MeSH-term 2Subject Heading

Studies included in the review  
(n = 24)

Records excluded  
(n = 972)

Full-text articles excluded, with reasons  
(n = 35)

Full-text articles assessed for eligibility  
(n = 59)

Records excluded  
(n = 942)

Abstracts screened   
(n = 1001)

Records screened  
(n = 1973)

Records identified through CINAHL searching excluding records from Medline (n = 486)

(n = )

## Identification

## Eligibility

## Included

## Screening

Records identified through Medline searching  
(n = 1487)

Figure 1. Flow chart over literature search (adapted from PRISMA flow diagram)

**Table 2a.** Interventions focusing on training

| **#** | **Study** | **Quality rating** | **Setting and sample** | **Intervention[[1]](#footnote-1)** | **Compassion outcomes/**  **measures** | **Other outcomes** | **Results[[2]](#footnote-2)** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | Ancel 2006  Uncontrolled before and after study | Low | Nurses n=190  Adult department, Hospital setting, Turkey | C: no control group  I: training program empathic skills communication | Empathic communication skills  ECS-B | Satisfaction with the program  Trainees’ satisfaction form | Significant increase in nurses’ emphatic skills after training  (ECS-B +24.9 p=0.05)  Of the nurses: 98.9% found the trainers -, 99.2% materials and techniques -, 97.7% content and its relevance adequate (Trainees’ satisfaction form) |
| 2 | Boscart 2009  Uncontrolled before and after study | Low | Patients n=27  RNs and Lic. practical nurses n=27  Hospital setting, Canada | C: no control group  I: 3 hour educational intervention on verbal interactions between nursing staff and patients | Quality of verbal interactions  (quantified content analysis) | None | Significant improvement in positive nurse-patient interactions (p=0.001) |
| 3 | Glembocki et al. 2010  Uncontrolled before and after study | Low | RNs (n=39)  Hospital settings, USA | C: no control group  I: Educational intervention Reigniting the spirit of caring (RSC) for 3 days seminar, focusing on relationship with self, colleagues and patients. | Caring Assessment for Caregiver tool (CAC) | None | Significant difference in Caring Assessment for Caregiver between pre- and posttest (p<0.05) |
| 4 | LaMonica et al.  1987  Cluster randomized controlled study | Medium | Nurses n=115  Patients n=656  Hospital setting,  USA | C: 16 hours course in physical assessment  I: empathy training program 14-16 hours | Empathy outcomes  ECRS | Patient satisfaction  LOPSS  Patient mood and satisfaction  MAACL | No significant difference in empathy outcomes in nurses and patients’ rating after the intervention (ECRS nurses 171.3 vs 177.0 p>0.05, ECRS patients 201.0 vs 228.5 p=0.05).  No significant difference in patient satisfaction (LOPSS p= >0.05) and mood between the experimental and control groups after treatment, but a significant difference in anxiety and hostility among patients cared for by the intervention group (MAACL p=0.004). |
| 5 | Langewitz et al. 2010  Uncontrolled before and after study | Low | Nurses n=70  Hospital setting, Switzerland | C: no control group  I: workshop based communication skills training 2.5 day seminar including role-play, video and telephone supervision (5 x 30 min) and booster after 6 months | Patient centred communication style RIAS | None | Significant difference in patient centeredness after the intervention (RIAS p<0.003) |
| 6 | Puentes 1995  Post-test only randomized, controlled study | Low | Registered nurses, n=98  Hospital setting, USA | C=usual practice  I=one hour reminiscence learning experience educational program for nurses focusing on the incorporation of reminiscence techniques into interactions with clients, plus request to participants to implement techniques during the subsequent 3 weeks. | Empathy levels  HES | Attitudes towards older adults  KAOP | Significant difference in empathy levels between experimental and control groups (HES 19.12 vs 17.84 p<0.05)  Significant difference in attitudes towards older adults between experimental and control groups (KAOP 153.27 vs 140.96 p<0.000) |
| 7 | Searcy 1989  Before and after study  with separate intervention and control groups | Low | Patients, n=298  Hospital setting, USA | C=usual practice  I=2 x 1 hour classes over a 2 week period aimed at enhancing nurses’ skills for perceiving and responding with empathy. | Empathy levels  LEP | Patient satisfaction, including dissatisfaction, perceptions of interpersonal support and good impression of nursing care  LOPSS | No significant difference after training on empathy (LEP 2.69 vs 2.74 p=0.48), total patient satisfaction (LOPSS 112.45 vs 112.16 p=0.91), dissatisfaction (2.65 vs 2.71 p=0.39), interpersonal support (2.75 vs 2.73 p=0.75), or good impression (2.83 vs 2.78 p=0.4) in the intervention group.  No significant differences from control (p>0.5). |
| 8 | Taylor et al. 2008  Uncontrolled before and after study | Low | RNs and nursing students, n=201  Religious university, non-religious university, religious health care institution, non-religious health care institution, USA. | C=no control group  I=mailed self study programme including 100-page interactive workbook and DVD on talking with patients about spirituality | Ability to respond empathically to patient spiritual pain RES | Personal spiritual experience  DSE  Attitude toward spiritual caregiving  SCPS-R  Knowledge about how to communicate to provide spiritual care  CSCT | Significant improvements in empathic response to patient spiritual pain (RES +12.2 p=<0.0001), personal spiritual experience (DSE -3.2 p=<0.0001), attitude to spiritual caregiving SCPS-R +3.0 p=<0.0001) and knowledge about communication for spiritual care (CSCT +2.0 p=<0.0001) post intervention. |
| 9 | Wasner et al. 2005  Uncontrolled before and after study | Low | Palliative care professionals,  n=63  Range of medical and social care settings, Germany. | C=no control group  I=3½ day training to teach active and compassionate listening, and recognition and addressing causes of emotional and spiritual suffering; includes practical exercises and introducing contemplation and meditation practices. | Self transcendence: sense of connectedness within the self and with one’s environment  STS  Compassion with severely ill and dying persons  Numeric rating (0-10)  Compassion with oneself  Numeric rating (0-10) | Spiritual wellbeing  FACIT-Sp  Religiosity  IIR  Quality of life  Numeric rating (0-10)  Attitude towards one’s family  Numeric rating (0-10)  Fear of dying process and death  Numeric rating (0-10)  Contentment with job  Numeric rating (0-10)  Meaningfulness of job  Numeric rating (0-10)  Attitudes towards colleagues  Numeric rating (0-10)  Perception of work-related stress  Numeric rating (0-10) | Significant improvement in compassion for the dying (+0.5 p<0.01) and for oneself (+0.9 p<0.01) after the training and sustained six months later (+0.5 p<0.05; +0.7 p<0.05). Self-transcendence significantly improved after the training (STS +1.9 p<0.01) but no significant difference from baseline to 6 months later (STS +0.8 p>0.05).  Significant improvement in spiritual wellbeing after the training (FACIT-Sp +2.0 p<0.01) and sustained six months later (+0.8 p<0.05).  Significant improvements after the training of quality of life (+0.6 p<0.05), attitudes towards family (+0.7 p<0.01), fear of dying (+0.6 p<0.05), fear of death (+0.7 p<0.01), work satisfaction (+0.7 p<0.01), meaningfulness of work (+0.4 p<0.01), attitude towards colleagues (+0.4 p<0.05), and work-related stress (+1.3 p<0.01). Significant differences from baseline sustained at 6 months in all measures using numeric rating (0-10) with exception of quality of life, fear of death and meaningfulness of work.  No significant difference in religiosity between baseline and six months (IIR -0.4 p>0.05). |
| 10 | Yeakel et al. 2003  Uncontrolled before and after study | Low | Patients (n=477)  Hartford hospital general surgery unit, USA. | C=no control group  I=Educational program for RNs during one month (a formal education session, staff identification of goals, peer reinforcement, incorporation of goals into performance management, posting of examples of caring behaviors on the unit to serve as reminders for the staff. | Nurse caring  Wolf’s Caring Behaviors Inventory | Patient satisfaction Hartford Hospital  Satisfaction Survey | Patients admitted after the intervention rate Nurses´ caring higher  (Z = -2.14, p = 0.032).  Patients admitted after the  intervention provided higher  ratings of satisfaction than patients  admitted before the intervention  (Z = -2.86, p = 0.004). |

1 C=Control group, I=Intervention group

2 Mean difference between two groups, plus measure of statistical significance

**Table 2b.** Interventions focusing on care models

| **#** | **Study** | **Quality rating** | **Setting and sample** | **Intervention[[3]](#footnote-3)** | **Compassion outcomes/**  **measures** | **Other outcomes** | **Results[[4]](#footnote-4)** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | Brown Wilson et al. 2013  Uncontrolled before and after study | Low | Staff (n=11)  Residents (n=6)  Familes (n=4)  Managers (n=3)  Care homes (n=2), UK | C=no control group  I= training programme based on the Senses Framework (Nolan et al. 2006), including eight workshops | Care profiles to assess how a service might enhance resident, staff and family’s sense of continuity, significance, belonging, purpose, achievement, security. |  | Improvements reported in staff sense of security and belonging; and in practices theorised to improve residents’ sense of significance, continuity and purpose.  Statistical significance of changes not reported. |
| 2 | Chenoweth et al. 2014  Cluster randomized controlled study | High | People with dementia (n=601)  Residential aged care homes (n=38), Australian | C=usual practice  I=implementation of either person-centered care (PCC) or person-centered environment (PCE) or an combination of them both (PerCEN) | Care interaction quality (QUIS)  Resident emotional responses in care assessment (ERiC) | Quality of life (DEMQoL)  Behavioural and psychological symptoms of dementia (Cohen-Mansfield Agitation Inventory CMAI) | Care interaction quality: Significant overall effect from group by time interaction, but significant improvement in PerCEN group only (p=0.006).  Resident emotional responses to care: No significant overall effect from group by time interaction. Significant improvement in PerCEN group only (p=0.01)    Quality of life: No significant overall effect from group by time interaction. Significant improvements in PCC (p=0.0003) and PCE (p=0.02) groups, but not in PerCEN group.  Agitation: Significant overall effect from group by time interaction. Significant improvements in PCC (p=0.002) and PCE (p=0.05) groups, but not in PerCEN group. |
| 3 | Finnema et al. 2001  Cluster randomized controlled study | Medium | Family members for residents (n=194)  Staff members (n=230)  Nursing homes (16 wards in 14 nursing homes), Netherlands | C: usual practice with implementation of a Model care plan  I: implementing of Emotion-oriented care in combination of Model care plan. Training and supervision in Emotion-oriented care for 9 months. | None | Quality of care (developed instrument, 18 questions) | An increase of quality of care regarding the question `*Has anyone asked you about your relative's life history after the initial intake meeting*?' in the experimental group after emotion-oriented care implementation (p=0.05) |
| 4 | Ho et al. 2015  Uncontrolled before and after study | Low | Residents (n=17)  Nursing homes, China | C: no control group  I: Implementing of Dignity-conserving end of life care model (several components of education and supportive care, at both group and individual level, advance care planning, pain and symptom management etc.) | None | McGill Quality of life questionnaire (MQoL)  Nursing facilities quality of life questionnaire (NF-QoL) | A significant deterioration in physical QoL (p<0.05), and improved support QoL (p<0.05) between pre- and post test.  No significant difference in Nursing facilities quality of life (NF-QoL) were found. |
| 5 | McCance et al. 2008  Uncontrolled before and after study | Low | Nurses n=122  Patients n=107  Hospital setting,  Ireland | C: no control group  I: person centred nursing (PCN) intervention based on framework of PCN and a model by Garbett and McCormack (2006). | Person centred nursing  PCNI: Including  CDI and NDI | None | Significant difference over time in nurses’ perception of caring (CDI 0.38 vs 0.45 p=<0.05) after intervention.  Significant difference over time in patients’ perceptions of caring (NDI 0.41 vs 0.45 p=<0.05) |
| 6 | McGilton et al. 2003  Before and after study with separate intervention and control groups | Medium | Residents (n=50)  Nursing staff (n=34)  Nursing homes, Canada | C: usual practice  I: implementing Relationship-Enhancing program of care (REPC) | Relational care (RC scale)  Close relationship with care providers (VAS)  Care providers’ empathic and reliable behaviour (RB, an observational scale) | Continuity of care (The continuity index) | Significant difference in Relational care (p=0.014), Care providers´ relational behaviour (p=0.046) between the experimental and control group.  Significant difference in  Continuity of care (p<0.001). |
| 7 | McGilton et al.  2010  Uncontrolled before and after study | Low | Nurses n=18  Patients n=9  Stroke continuing care unit, Canada | C=no control group  I=development of individualized patient communication plans by speech and language pathologists (SLPs); nurse attendance at full day workshop focused on communication and behavioural management stratgeies; implementation of nursing staff support system by SLPs: observing interactions, providing feedback and demonstrating strategies. | Patient satisfaction with nurses’ relational care  RCS  Global perception of closeness of nurse-patient relationship  Patient Close VAS  Provider Close VAS | Patient quality of life  SAQOL  Patient depression  GDS  Attitude of nurses towards patients with communication impairments  CIQ | Significant improvement in patient satisfaction with nurses’ relational care (RCS +3.1 p=0.024), patient perceptions of closeness of relationship with nurses (VAS +15.9 p=0.041), patient perception of own communication abilities (SAQOL +3.8 p=0.037), and nurse attitudes towards patients with communication impairment (CIQ +2.4 p=0.007) post intervention.  No significant differences in patient psychosocial wellbeing (SAQOL +1.8 p=0.601), patient depression (GDS +0.3 p=0.848), or nurse perceptions of closeness of relationship with patients (VAS +3.4 p=0.657) post intervention. |
| 8 | Pipe et al. 2010  Uncontrolled before and after study | Low | Patients (n=19)  General medical ward, USA. | C=no control group  I=Life story intervention based on Watson’s theory of human caring (2008), including trained volunteers completed Life story  interviews and created a “Tree of Life” poster for every patient | None | Quality of Life, Linear Analogue Self-Assessment  (LASA) Instrument.  Emotional wellbeing, Social support, Medical Outcomes Study (MOS)  Social Support Survey.  Hope, Herth Hope Index (HHI).  Expanded Version of the Functional  Assessment of Chronic Illness  Therapy—Spiritual Well-Being Scale  (FACIT-Sp-Ex). | Quality of life: A significant improvement in  physical well-being (p= 0.02), and emotional well-being (p= 0.005) after intervention.  No significant improvement in emotional wellbeing (MOS) and Hope (HHI).  A significant improvement of spiritual wellbeing (FACIT-Sp-Ex)  (p = 0.02) |

1 C=Control group, I=Intervention group

2 Mean difference between two groups, plus measure of statistical significance

**Table 2c.** Interventions focusing on nurse support

| **#** | **Study** | **Quality rating** | **Setting and sample** | **Intervention[[5]](#footnote-5)** | **Compassion outcomes/**  **measures** | **Other outcomes** | **Results[[6]](#footnote-6)** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | Flarity et al. 2013  Uncontrolled before and after study | Low | Nurses n=73  Emergency care, USA | C: no control group  I: multifaceted  compassion fatigue resiliency intervention program: 4 hour interactive seminar plus multimedia resources | Compassion satisfaction  ProQOL CS subscale  Compassion fatigue  ProQOL BO subscale | Secondary traumatic stress  ProQOL STS subscale | Significant increase in compassion satisfaction (ProQOL CS +1.9 p=0.004), and decrease in burnout (ProQOL BO -3.9 p<0.001) and secondary traumatic stress (ProQOL STS -2.1 p=0.001) post intervention. |
| 2 | Gauthier et al. 2015  Uncontrolled before and after study | Low | Nurses n=60  Paediatric ICU, USA | C=no control group  I= 5 minute mindfulness meditation / instruction in workplace at the beginning of each shift for 30 days | Symptoms of burnout  MBI  Self-compassion  SCS | Levels of stress  NSS  Mindfulness  MAAS  Job satisfaction | No significant differences in burnout, emotional exhaustion and depersonalisation (mean, p not reported). Burnout personal accomplishment increased post but decreased at  one month follow up (p=0.03).  No significant increase in self-compassion (SCS difference not reported, p=0.26).  Significant decrease in stress  from baseline (78.92) to post-intervention (74.03, p = .006]. and 1 month follow up (p not reported).  No significant differences in mindfulness (MAAS, difference not reported, p=.37), job satisfaction (positive change reported, p=.15). |
| 3 | Horner et al. 2014  Before and after study with separate intervention and control groups | Low | Nurses n=43  Patients n=unknown  Hospital setting,  USA | C: usual practice  I: mindfulness training program 10 weeks, 30 min once a week including education and practice | Compassion satisfaction score and burnout score  ProQOL | Level of mindfulness  MAAS measure  Individual and unit stress levels (VAS 1-10)    HCAHPS – hospital patient survey | No significant difference in compassion satisfaction score before and after intervention (ProQOL 53.20 vs 52.93 p=0.76), or burnout score (ProQOL 46.20 vs 45.71 p=0.55) or level of mindfulness (MAAS 4.2 vs 4.4 p=0.37) in the intervention group.  Significant difference before and after the intervention in individual stress (Individual stress level 5.0 vs 4.2 p=0.10) and unit stress (Unit stress level 5.8 vs 5.1) in the intervention group.  No significant difference in the control group.  Patient satisfaction (HCAHPS): Improvement in overall scores in the intervention group (32 points) compared to the control group, and improvement in “communication with nurses” (17 points). |
| 4 | Palmer 2010  Uncontrolled before and after study | Low | Nurses n=9  Hospice at home, UK | C=no control group  I= 8 week mindfulness based cognitive therapy training | Clinician empathy  JCES | Mindfulness  MAAS  Wellbeing  WHO-5  EWWS | Improvements in scores across all scales reported post intervention compared to “expected population averages” but no further details reported. |
| 5 | Palsson et al. 1996  Before and after study with separate intervention and control groups | Medium | RNs, n=33  District nursing for women with newly diagnosed breast cancer, Sweden | C= 40 hr training programme on medical care and treatment for breast cancer, psychological reactions, coping strategies, crisis intervention, and organization of nursing care  I=training programme (as above) + 1½-2 hrs clinical supervision every 2-4 weeks, 15-19 sessions. | Burnout  BM  Empathy  ECRS | Sense of coherence  SOC | No significant difference (p>0.05) after clinical supervision on burnout (BM 2.7 vs 2.5) empathy (ECRS 419 vs 427) or sense of coherence (SOC 148 vs 151) in intervention group. No significant differences from control. |
| 6 | Potter et al. 2013  Uncontrolled before and after study | Low | RNs, n=13  Outpatient oncology infusion center, USA | C=no control group  I=5 week programme involving five 90 minute sessions on compassion fatigue resiliency | Symptoms of burnout  MBI  Compassion satisfaction  ProQOL IV CS subscale  Compassion fatigue  ProQOL IV BO subscale | Subjective distress caused by traumatic events, including avoidance, intrusions, hyperarousal  IES-R  Secondary traumatic stress  ProQOL STS subscale  Nursing job satisfaction  NJSS | No significant difference in symptoms of burnout between baseline and immediate post-intervention, 3 months later and 6 months later (MBI Emotional Exhaustion subscale: immediate -2.92 p>0.05; 3 months -2.38 p>0.05; 6 months -3.46 p>0.05. MBI Depersonalization subscale: immediate -1.46 p>0.05; 3 months -1.31 p>0.05; 6 months -0.31 p>0.05. MBI Personal Accomplishment subscale: immediate -0.92 p>0.05; 3 months -1.15 p>0.05; 6 months -2.15 p>0.05).  No significant difference in compassion satisfaction (ProQOL CS: immediate -0.38 p>0.05; 3 months -1.0 p>0.05; 6 months -1.23 p>0.05).  No significant difference in compassion fatigue (ProQOL BO: immediate -0.85 p>0.05; 3 months -0.23 p>0.05; 6 months -1.15 p>0.05).  No significant difference in job satisfaction (no further details reported).  Significant improvement in subjective distress caused by traumatic events between baseline and immediate post-intervention, (IES-R +1.24 p=0.04) 3 months later (+2.4 p<0.001) and 6 months later (+1.77 p=0.005).  Significant decline in secondary traumatic stress between baseline and 6 months (+3.54 p=0.044). |

1 C=Control group, I=Intervention group

2 Mean difference between two groups, plus measure of statistical significance





1. C=control group, I=intervention group [↑](#footnote-ref-1)
2. Mean difference between two groups, plus measure of statistical significance [↑](#footnote-ref-2)
3. C=control group, I=intervention group [↑](#footnote-ref-3)
4. Mean difference between two groups, plus measure of statistical significance [↑](#footnote-ref-4)
5. C=control group, I=intervention group [↑](#footnote-ref-5)
6. Mean difference between two groups, plus measure of statistical significance [↑](#footnote-ref-6)