

[A systematic review and meta-analysis of the prevalence and associations of stress and burnout among staff in long-term care facilities for people with dementia.](#)

Dr Harry Costello* MBBS¹, Dr Sebastian Walsh MBChB¹, Dr Claudia Cooper PhD¹, Prof. Gill Livingston MD¹

1. Division of Psychiatry, Faculty of Brain Sciences, UCL, Maple House, 149 Tottenham Court Road, W1T 7NF, London, UK

*Corresponding author Dr Harry Costello (harry.costello@ucl.ac.uk)

Abstract

Background: Care home staff stress and burnout may be related to high turnover and associated with poorer quality care. We systematically reviewed and meta-analysed studies reporting stress and burnout and associated factors in staff for people living with dementia in long-term care.

Methods: We searched MEDLINE, PsycINFO, CINAHL and Web of Science databases from January 2009 to August 2017. Two raters independently rated study validity using standardised criteria. We meta-analysed burnout scores across comparable studies using a random effects model.

Results: 17/2854 identified studies met inclusion criteria. Eight of the nine studies reporting mean Maslach Burnout Inventory (MBI) scores found low or moderate burnout levels. Meta-analysis of four studies using the 22-item MBI (n=598) found moderate emotional exhaustion levels (mean 18.34, 95% Confidence Intervals 14.59-22.10), low depersonalisation (6.29, 2.39 -10.19), and moderate personal accomplishment (33.29, 20.13-46.46). All three studies examining mental health-related quality of life reported lower levels in care staff than age and sex matched populations. Staff factors associated with higher burnout and stress included: lower job satisfaction, lower perceived adequacy of staffing levels, poor care home environment, feeling unsupported, rating home leadership as poor and caring for residents exhibiting agitated behaviour. There was preliminary evidence that speaking English as a first language and working shifts were associated with lower burnout levels.

Conclusions: Most care staff for long-term care residents with dementia experience low or moderate burnout levels. Prospective studies of care staff burnout and stress are required to clarify its relationship to staff turnover and potentially modifiable risk factors.

Introduction

Most care home residents live with dementia (Luppa et al. 2010; Livingston et al. 2017) and are cared for by staff who may experience high physical and psychological workloads (Fjelltun et al. 2009), which may lead to burnout and delivery of lower quality care (Woodhead et al. 2016).

Though often conceptualized within the same framework, stress and burnout differ. Burnout is a work-related syndrome, resulting from prolonged job stressors (Maslach et al. 2001). It is usually defined as comprising three components: emotional exhaustion (EE) which is a feeling of emotional depletion; depersonalisation (DP), also labelled as 'cynicism', which describes the development of negative, cynical attitudes towards care recipients; and lastly, staff negative perceptions about their own professional accomplishment (PA) (Maslach and Jackson 1981). In contrast, stress is a broader description of a state of mental or emotional strain resulting from adverse or demanding circumstances, which does not necessarily lead to staff burnout (Pines 2002). High levels of emotional exhaustion and stress are linked, while depersonalisation may protect from stress, possibly as it leads to staff being less concerned about residents (McManus et al. 2002).

In the 2010 House of Commons report on improving dementia services in England, urgent concerns were raised about high staff turnover and vacancies in dementia care (Committee of Public Accounts, 2010). More recently it has been suggested that 'job satisfaction, stress and burnout have a significant correlation with [nurses'] intention to leave and the UK has one of the highest rates of nurses reporting burnout across Europe' (Health Education England, 2014). However, it is unclear how common and to what degree burnout affects care home staff in England or other countries.

High staff turnover in care homes is associated with lower quality of care (Castle and Engberg 2005). Increased job stress and self-perceived delivery of poor care (Schmidt et al. 2014) have been linked with high staff turnover and absenteeism (Schaefer and Moos 1996; Chiu et al. 2009; Larrabee et al. 2010), although social support may be protective (Woodhead et al. 2016). Furthermore high job strain in mid-life significantly increases the risk of onset of mental illness (Harvey et al. 2018). Despite the many challenges staff caring for people with dementia in 24 hour care settings face (Zimmerman et al. 2005), an earlier systematic review found only five studies evaluating stress or burnout in long-term care staff (Pitfield, Shahriyarmolki et al. 2011). The authors concluded that most staff who remain working in homes do not report high levels of stress or burnout.

We aimed to update the evidence in this important area. Our objectives were: (1) to synthesise and meta-analyse the evidence regarding the prevalence and level of burnout and psychological stress in staff caring for people living with dementia in long-term care and (2) to examine putative socio-demographic, employment (nurse, care assistant, day or night or both, professional experience, education) and other risk factors.

Method

The protocol was registered on PROSPERO (number CRD42017074762).

We searched MEDLINE (1950–), PsycINFO (1872–), CINAHL (1961–) and Web of Science (1945–) databases from 2009 to 10th August 2017. Our search terms were: care, nursing, residential, old age, part III/three/3, elderly mentally ill/EMI, 24 hour care or old people's

homes, combined with staff, carers, workers, care workers, nurses, nursing assistants, employees or health care assistants, combined with burden, burnout, stress, distress, anxiety, depression and strain. We included primary, quantitative research studies that used a valid and reliable instrument to measure psychological distress or burnout in staff directly caring for people with dementia living in a 24-hour, long-term care settings.

Data extraction and quality assessment

We extracted data from all studies and two authors (HC, SW) independently rated the papers' quality according to eight criteria, with one point for each positive answer (Boyle 1998). These criteria were also used in an earlier systematic review of burnout in this population (Pitfield, Shahriyarmolki et al. 2011). We only included studies that (1) had a valid measure of burnout or psychological distress and (2) used standardised data collection for inclusion, and therefore all studies scored a minimum of two points. Higher quality studies were defined as those meeting six criteria and above (i.e. validity score of 6 or more).

The criteria were:

- (1) Was the target population clearly defined by clear inclusion and exclusion criteria?
- (2) Was probability sampling used to identify potential respondents (or the whole population approached)?
- (3) Did characteristics of respondents match the target population, i.e. was the response rate $\geq 80\%$ or appropriate analysis included comparing responders and non-responders?
- (4) Were data collection methods standardized?
- (5) Was the burnout/psychological distress measure reliable? (If the original measure was valid but it was translated or adapted without reliability of changed measure being reported, we allocated 0.5 points.)
- (6) Was the burnout/psychological distress measure valid? (If the original measure was valid but it was translated or adapted without validity of changed measure being reported, we allocated 0.5 points.)
- (7) Were features of sampling accounted for in the analysis, through appropriate weighting of the data, or the whole population approached?
- (8) Did the reports include confidence intervals for statistical estimates or, if not, did they provide sufficient data to allow for confidence intervals to be calculated?

Analysis

If studies were longitudinal or trials of interventions with multiple data collection points, we examined baseline data. We calculated 95% Confidence Intervals (CIs) for the prevalence or mean values of distress or burnout where the authors had provided sufficient information but had not given CIs. The criterion for conducting meta-analysis was if three or more studies with comparable burnout measures were identified. We used random effects models in StatsDirect software (version 3.1.14) to meta-analyse pooled mean effect scores from studies, as it is suitable for combining studies where heterogeneous populations are reported as it accounts for between-study variance. We rated heterogeneity using I^2 indexes. We categorised results using burnout cut-off scores based on American normative population data (Maslach and Jackson 1981, Schaufeli 1995).

Results

We identified 2854 papers, excluded 2681 of these by title and retrieved the remaining 173 full papers; we included 17 of these in the final systematic review (see PRISMA diagram in Figure 1).

Validity criteria score (see Table 1)

The majority (14/17) of studies used probability sampling to identify respondents or approached the whole population. 8/17 studies fulfilled 6 criteria or more during quality assessment and were rated higher quality. Only 4/17 studies accounted for non-responders or had a response rate over 80%. Two studies from the same author used a measurement tool with a low reported reliability coefficient score (Cronbach's alpha = 0.49) (Edvardsson et al. 2009, Edvardsson et al. 2014).

Studies reporting care staff burnout (Table 2)

Levels of burnout

Nine studies reported mean burnout scores in care staff working in either nursing or residential care home facilities in eight different countries. Seven used versions of the MBI; four employed the complete 22-item MBI (Barbosa et al. 2015; Duffy et al. 2009; Furumura et al. 2014; Juthberg et al. 2010), one a 9-item version (Chamberlain et al. 2017). Two studies used a 20-item Dutch translation of the MBI, called the Utrecht Burnout Scale (UBOS) (de Rooij et al. 2012; Willemse et al. 2015).

Four studies found low levels and three studies moderate levels of emotional exhaustion (see Table 2). The highest reported emotional exhaustion score was found in a small sample (n=61) of staff working in seven UK continuing care homes for residents with dementia (Duffy et al. 2009). All six studies reporting the depersonalisation subscale score found moderate or low levels of depersonalisation (see table 2). Seven studies found moderate or high scores of personal accomplishment. The only study to report high burnout in any subscale was of 333 care staff working in Dementia nursing homes in Japan that found low levels of personal accomplishment (Furumura et al. 2014).

Meta-analysis of the four studies that used the complete 22-item MBI found moderate mean emotional exhaustion levels (mean 18.34, 95% CI 14.59-22.10), low depersonalisation (6.29, 2.39 -10.19), and moderate personal accomplishment (33.29, 20.13-46.46) (Figures 2-4). Heterogeneity between studies in the meta-analysis was high, with I^2 indexes of 95.1%, 98.8% and 99.8% for emotional exhaustion, depersonalisation and professional accomplishment respectively.

Prevalence of burnout

Three studies reported prevalence of burnout (Duffy, et al. 2009; Juthberg et al. 2010; Chamberlain et al. 2017). All used different cut-off points, only one of which was validated for the population (Juthberg et al. 2010). The percentage of staff reporting high levels of emotional exhaustion ranging from 22.1% to 68.6%, depersonalisation ranging from 9.2% to 46% and low levels of personal accomplishment, ranging from 4% to 24.5% (Duffy et al. 2009; Juthberg et al. 2010; Chamberlain et al. 2017).

Two studies used the four-item 'Personal Burnout' scale of the Copenhagen Psychosocial Questionnaire (COPSOQ) in 731 and 305 care staff in German nursing homes respectively (Schmidt et al. 2012; Schmidt et al. 2014). Burnout scores were significantly higher relative

to the comparative normative data available from Denmark (mean = 43.9 SD 27.0 vs mean = 34.1 SD 18.2) (Pejtersen et al. 2010; Schmidt et al. 2012). The second study (Schmidt et al. 2014) found similar results (2007: 42.7).

Studies using measures of care staff psychological distress (see table 3)

Three studies used versions of the Short Form-36 (SF-36), to measure mental health-related quality of life score in staff working in care homes in Australia, Brazil and the United Kingdom respectively (Gao et al. 2014; Lucchetti et al. 2014; Islam et al. 2017). All found lower mental health quality of life scores than the equivalent age and sex matched normative populations. One of these studies additionally reported that of the 105 nurse aides that participated in the study, 5.8% were depressed, 23.2% had significant anxiety and 38% experienced significant stress, using the Beck Anxiety Inventory (BAI) and Beck Depression Inventory (BDI), though the definition of 'significant stress' and diagnostic cut offs were not reported (Lucchetti et al. 2014).

A study of 198 staff working in care homes in Norway measured symptoms of anxiety and depression using the 10-item Hopkins Symptom Check List (HSCL-10) (Testad et al. 2010). The mean item score (1.33) was lower than the cut point for psychological distress (>1.85) (Testad et al. 2010). The two other studies reporting mean stress score used the Health Professions Stress Inventory (HPSI) and Swedish Demand-Control-Support Questionnaire (SDCS) which are valid measures of job strain and stress but do not generate a diagnosis nor have population normative values (Edvardsson et al. 2014; Vogel et al. 2017).

Summary

- A meta-analysis of four studies found that staff had moderate levels of emotional exhaustion and personal accomplishment and low levels of depersonalisation relative to USA normative data.
- None of the seven studies measuring mean burnout with the MBI found high levels of emotional exhaustion or depersonalisation. One large study reported low levels of personal accomplishment.
- All three studies examining mental health-related quality of life scores reported lower levels in care staff than the equivalent age and sex matched normative populations. In one study comparing care staff mental health to normative population data, levels of psychological distress were not elevated.

Factors associated with staff burnout or psychological distress

Demographic factors

The two largest studies to measure the association between age and burnout (n=1194) (Chamberlain et al. 2017), or age and stress (n=344) (Edvardsson et al. 2009), found no significant association. This was consistent with a study of 212 UK care staff which reported no association between length of time working in the care sector (which has a relationship to age) and mental health related quality of life (Islam, Baker et al. 2017). However, 3/6 smaller studies found that younger age was associated with higher emotional exhaustion (Duffy et al. 2009), higher depersonalisation (Furumura 2014) and higher stress (Lucchetti et al. 2014). Furthermore, a study of 198 care staff in nursing homes in Norway reported higher age was correlated with perceived stress (Testad et al. 2009).

Most care staff in the studies were female. Only one of three studies reporting the relationship between burnout or psychological stress and care staff gender found a significant association: that male staff had higher depersonalisation scores (Furumura 2014).

One large Canadian study of care aides working in nursing homes examined the association between staff's first language and burnout. Of 1194 care aides included, 48.3% did not speak English as a first language and this was associated with higher levels of emotional exhaustion ($p = 0.008$) and depersonalisation ($p = 0.002$) (Chamberlain et al. 2017).

Summary

- 6 studies ($n=2116$) examined age of care staff with burnout and stress with no association found in most ($n=1617$).
- 3 studies ($n=1739$) examined the association of burnout or stress with sex of care staff with no clear association with no association found in most ($n= 1406$).
- The only study ($n=1194$) to consider first language reported significantly higher levels of emotional exhaustion and depersonalisation in nursing home staff who did not speak English as a first language.

Staff role, education, experience and shift patterns

Two studies assessed whether stress and burnout levels varied with staff role (Juthberg et al. 2010; Islam et al. 2017). No significant difference in burnout levels was found between 50 nurses and 96 nurse aides working in care homes in Sweden (Juthberg et al.2010). In contrast a UK study in 72 care homes found that nursing staff experienced less job satisfaction and lower mental health-related quality of life than staff without a nursing qualification (Islam et al. 2017). This was in line with a study of 333 staff in Japanese nursing homes that found significantly lower levels of personal accomplishment in carers with formal care qualifications (Furumura et al. 2014). However, a study of 344 care staff in Sweden found education levels to be significantly lower in those reporting higher job strain (Edvardsson et al. 2009).

The only study to consider turnover, found shift work was negatively associated with turnover in 239 care staff ($b= 0.22$, $p =0.02$) (Gao et al. 2014). Greater care aide job satisfaction was associated with lower burnout on all three burnout subscales of the MBI (Chamberlain et al. 2017). Similarly, nurses that reported high levels of satisfaction with quality of care for residents with dementia had lower levels of burnout and higher general health (Schmidt et al. 2014).

Summary

- We found conflicting evidence regarding whether carer role and qualifications was associated with burnout or stress levels.
- One study of 239 care staff found that turnover was lower in staff who did shift work.
- Both studies ($n=1499$) exploring job satisfaction found that higher satisfaction was associated with lower burnout.

Staffing and care facility-related factors

Three studies ($n=5204$), examined staffing levels. Higher perceived staffing and resource adequacy on the Practice Environment Scale-Nursing Work Index (PES –NWI) (Lake 2007) was significantly associated with lower stress on all three dimensions of stress of the HPSI ($p<0.001$) in 3922 care staff in Switzerland (Vogel et al 2017.). A study of 1194 care staff in Canadian nursing homes found perception of fewer staffing resources were associated with increased emotional exhaustion (Chamberlain et al. 2017). Similarly, in a Swedish study of

88 care staff, those with insufficient time to accomplish their work reported more job strain (Edvardsson et al. 2009).

Four studies (n=5408) assessed care home factors. A study of 80 care staff, comparing burnout between 'small-scale' and 'traditional' long-term care settings in Belgium and the Netherlands concluded that staff experienced significantly more emotional strain in small scale (size undefined) compared to traditional settings (de Rooij et al. 2012). By contrast, in Canadian nursing homes (n=1194) significantly higher emotional exhaustion was found in medium (80-120 bed) compared to small (35-79 bed) facilities but no difference in burnout level was found between small and large (>120 bed) facilities (Chamberlain et al. 2017). A UK study found that nursing home staff reported worse mental health and wellbeing on the SF-12 than staff working in residential homes (Islam et al. 2017). Finally, a study of 3922 Swiss care staff found dementia specialist care unit staff reported higher stress levels than those on non-specialised units (Vogel et al. 2017).

Summary

- All three studies (n=5204) examining perceived low staffing levels found it was associated with increased stress, job strain and emotional exhaustion.
- There was contradictory findings from the two studies (n=1274) to explore relationships of stress or burnout to care home size.
- In two individual studies, stress levels were higher in UK nursing home staff (compared to residential homes) (n=212) and in Swiss dementia specialist care unit staff compared to non-specialist units (n=3922).

Work environment

All 7 studies (n=7186) that evaluated the relationship of the work environment to burnout or stress in care staff reported a relationship between a poor environment and burnout or stress. A study of 1194 care staff found a perception of insufficient space to discuss care needs was associated with increased emotional exhaustion (Chamberlain et al. 2017).

Higher burnout scores were found in 1093 care staff in the Netherlands reporting higher job demands, greater authority to make their own decisions at work and less supervisor or co-worker support (Willemse et al. 2012). The same study found supervisor support protected against emotional exhaustion related to job demands in staff with low decision authority, however co-worker support was associated with lower personal accomplishment scores in high job demands settings (Willemse et al. 2012). Similarly, a study of 3922 care staff in Switzerland found those that perceived more effective leadership was associated with significantly less work stress (Vogel et al. 2017).

A study of 239 Australian nurses found those with lower reported job demands and higher coping resources reported significantly higher levels of emotional wellbeing as measured on the SF-36, and were less like to leave their role (Gao et al. 2014).

Perceived reciprocity with colleagues protected from emotional exhaustion, while self-efficacy was significantly negatively associated with burnout in 61 UK care staff (Duffy et al. 2009). Similarly, a study of 333 care staff in Japan found those who felt they lacked workplace support and reported conflict between staff had significantly higher levels of depersonalisation and lower personal accomplishment (Furumura et al. 2014). This finding of workplace support being a factor in staff burnout and stress was consistent with results in 344 care staff in Swedish nursing homes that found 'possibilities to have discussions' about difficult situations with colleagues at work was significantly associated with lower job strain (Edvardsson et al. 2009). The same study also found a 'perceived caring climate' in the unit,

as determined using a visual analogue scale ranging from 'very bad' to 'very good' was significantly associated with lower job strain (Edvardsson et al. 2009).

Summary

- All 7 studies (n=7186) that evaluated the relationship of the work environment to burnout or stress in care staff found a positive association between a poor environment and burnout or stress. Four studies (n=1575) found perceived support from colleagues protected against burnout and stress.
- Two studies (n=5015) found more effective perceived leadership protected against burnout and stress.
- Two studies (n=1332) found lower job demands was significantly associated with lower burnout and better emotional wellbeing.
- One study (n=61) examined 'self-efficacy' and found it was significantly associated with lower burnout.
- One study (n=344) found a 'perceived caring climate in the unit' was significantly associated with lower job strain.

Resident factors

3/4 studies examining the role of resident behaviour and agitation found a significant association with levels of burnout and stress in care staff. A study of 731 care staff in German nursing homes reported significantly higher levels of staff distress and burnout when there was more challenging resident behaviour, with highest distress related to resident aggression (Schmidt et al. 2012). Similarly, a study in 156 Swiss nursing homes found that staff who had experienced or observed verbal or sexual aggression against other residents had significantly higher stress scores compared to those who had not (Vogel et al. 2017). Care aides in Canadian nursing homes who experienced more dementia related agitated behaviours reported significantly higher levels of emotional exhaustion and depersonalisation (Chamberlain et al. 2017).

No significant association between agitation, as measured on the Cohen-Mansfield Agitation Inventory, and stress was found in 198 care staff in Norway (Testad et al. 2010).

Summary

- 3/4 studies (n=5847) found higher burnout or stress in care staff exposed to agitated or aggressive resident behavior.

Discussion

To our knowledge this is the largest systematic review of burnout and stress in staff caring for people with dementia in 24-hour care settings and the first meta-analysis. We found in meta-analysis, that staff in general report moderate levels of emotional exhaustion, low depersonalisation and moderate personal accomplishment. The only study to report high levels of burnout on any subscale was a study of 333 nurses working in a dementia care focused nursing home in Japan that reported low levels of personal accomplishment. The high heterogeneity that we found is in keeping with similar findings (I2 indexes >90%) in other meta-analyses of burnout using the MBI measure, with language, country and sampling method being moderator variables of heterogeneity (Aguayo et al. 2011). The possible stressors and protective factors are likely to vary between countries and the

differences suggests that burnout can be avoided or alleviated. We used normative data about burnout from America to classify burnout levels. However, there were differences in scoring cut points of burnout across countries (Maslach and Jackson 1981). The cut off points determined in the American normative sample are significantly higher than those for a Dutch normative sample (Schaufeli and Vandierendonck 1995).

Studies examining burnout or stress related factors suggested those caring for residents exhibiting abusive or aggressive behaviours, those who work in environments where they feel unsupported, had lower job satisfaction (which is unsurprising as it may be the opposite of personal accomplishment) - and a perceived lack of staff and resources, and one large study found higher levels in those who do not speak English (the language of the country in which the study took place) as a first language. Staffing levels can be higher because a home is better resourced or because the residents have more needs. Therefore perception of adequacy of staffing may be a better measure. However, perception of inadequate staffing it may also reflect feelings of emotional and physical exhaustion and be hard to disentangle. These factors may explain the wide range of reported prevalence of emotional exhaustion (22.1%-68.6%) in three studies and suggests there are at risk groups of carers with higher burnout levels.

We only examined burnout and stress in long-term care settings and it would be unsurprising if this varied between settings. For example, two studies in Japan in intermediate care and psychiatric hospitals reported high levels of burnout and stress in care staff (Tanaka et al. 2015, Yada et al. 2014). This may be because of higher care needs and more challenging behavioural symptoms of patients which are associated with burnout level of staff (Agoub, Elyazaji et al. 2000). It may also reflect sociocultural factors in Japan, which has the lowest proportion of residential care for people ≥ 65 years old, and the highest proportion of people aged ≥ 65 in hospitals (Ikegami and Campbell 1995, Ribbe, Ljunggren et al. 1997). An understanding of the country specific provision of care and care environments for people living with dementia is necessary to evaluate the pressures on staff working in these environments.

If burnout is not high then it is unlikely to account for high staff turnover. It is, however, possible that care staff with high burnout levels were not identified by these studies. Though many of the studies had high response rates, none considered whether responders differed from non-responders. This could result in a systematic bias. In addition, if people with high burnout leave more rapidly they will be less represented in a prevalence study.

There was a lack of longitudinal follow up of staff and only one study analysed staff turnover by sending follow up questionnaires to 239 Australian care staff after two years (Gao et al. 2014). This found that higher job demands and lower coping resources were directly associated with turnover. The only other study to follow up care staff showed an increase in burnout levels over a two year period (Schmidt et al. 2014). The group of staff reported as 'still satisfied' with the quality of care of residents with dementia, had the highest overall ratings of work ability (a measure of motivation and capability at work, assessed by the work ability index) and lowest burnout, which would support the idea that those who were dissatisfied and thus more likely to leave would be more burnt out.

Conclusion

We conclude that current evidence suggests that most staff caring for people living with dementia in long-term care do not have a high level of burnout or psychological stress. It is likely that there are at risk groups of care staff who are more susceptible to burnout and stress or who are in environments which are particularly likely to lead to burnout. Preliminary

evidence in small studies suggest these may include; factors relating to the difficulties of caring such as those who care for residents with aggressive behaviour; factors relating to working in a poor environment such as not having sufficient space; factors related to the care staff; such as not speaking English as a first language, which may make people feel culturally isolated and have less local family support as well; and feeling unsupported with poor leadership within the care setting. It is now important to have a large prospective study of burnout and find out if these factors are independently associated with higher burnout. Longitudinal follow-up will also enable the effect on staff turnover to be evaluated. This will enable understanding of what are logical interventions to target support of staff and improve resident care.

Acknowledgement

GL is supported by North Thames NIHR CLAHRC. CC and GL are supported by UCL NIHR BRU. HC is supported by UCL NIHR.

References

- Agoub, M., M. Elyazaji and O. Battas (2000). "Professional burn out and sources of stress among health care workers." *Annales Medico-Psychologiques* 158(9): 687-692.
- Aguayo R et al. (2011). "A meta-analytic reliability generalization study of the Maslach Burnout Inventory". *Journal of Clinical and Health Psychology*
- Astrom, S., M. Nilsson, A. Norberg and B. Winblad (1990). "Empathy, Experience of Burnout and Attitudes Towards Demented Patients among Nursing Staff in Geriatric Care." *Journal of Advanced Nursing* 15(11): 1236-1244.
- Barbosa, A., et al. (2015). "Supporting Direct Care Workers in Dementia Care: Effects of a Psychoeducational Intervention." *American Journal of Alzheimers Disease and Other Dementias* 30(2): 130-138.
- Boyle, M. H. (1998). "Guidelines for evaluating prevalence studies." *Evidence Based Mental Health* 1(2): 37-39.
- Brayne, C., L. Gao, M. Dewey, F. E. Matthews and M. R. C. C. Function (2006). "Dementia before death in ageing societies - The promise of prevention and the reality." *Plos Medicine* 3(10): 1922-1930.
- Castle, N. G. and J. Engberg (2005). "Staff turnover and quality of care in nursing homes." *Medical Care* 43(6): 616-626.
- Chamberlain, S. A., A. Gruneir, M. Hoben, J. E. Squires, G. G. Cummings and C. A. Estabrooks (2017). "Influence of organizational context on nursing home staff burnout: A cross-sectional survey of care aides in Western Canada." *International Journal of Nursing Studies* 71: 60-69.
- Chiu, Y. L., R. G. Chung, C. S. Wu and C. H. Ho (2009). "The effects of job demands, control, and social support on hospital clinical nurses' intention to turn over." *Applied Nursing Research* 22(4): 258-263.
- de Rooij, A. H. P. M., K. G. Luijkx, A. G. Declercq, P. M. J. Emmerink and J. M. G. A. Schols (2012). "Professional Caregivers' Mental Health Problems and Burnout in Small-Scale and Traditional Long Term Care Settings for Elderly People With Dementia in The Netherlands and Belgium." *Journal of the American Medical Directors Association* 13(5).
- Duffy, B., J. R. Oyebode and J. Allen (2009). "Burnout among care staff for older adults with dementia: The role of reciprocity, self-efficacy and organizational factors." *Dementia: The International Journal of Social Research and Practice* 8(4): 515-541.
- Edvardsson, D., P. Sandman and L. Borell (2014). "Implementing national guidelines for person-centered care of people with dementia in residential aged care: Effects on perceived person-centeredness, staff strain, and stress of conscience." *International Psychogeriatrics* 26(7): 1171-1179.
- Edvardsson, D., P. O. Sandman, R. Nay and S. Karlsson (2009). "Predictors of job strain in residential dementia care nursing staff." *Journal of Nursing Management* 17(1): 59-65.

- Fjelltun, A. M., N. Henriksen, A. Norberg, F. Gilje and H. K. Normann (2009). "Functional levels and nurse workload of elderly awaiting nursing home placement and nursing home residents: a comparative study." *Scandinavian Journal of Caring Sciences* 23(4): 736-747.
- Furumura, M. and T. Ishitake (2014). "[The relationship between burnout, personal traits, and the work environment of caregivers in group homes]." *Nippon Koshu Eisei Zasshi - Japanese Journal of Public Health* 59(11): 822-832.
- Gao, F. S., P. Newcombe, C. Tilse, J. Wilson and A. Tuckett (2014). "Models for predicting turnover of residential aged care nurses: A structural equation modelling analysis of secondary data." *International Journal of Nursing Studies* 51(9): 1258-1270.
- Harvey S.B, A Mykletun et al. (2018) The role of job strain in understanding midlife common mental disorder: a national birth cohort study. *The Lancet Psychiatry*. S2215-0366(18)30137-8
- Ikegami, N. and J. C. Campbell (1995). "Medical-Care in Japan." *New England Journal of Medicine* 333(19): 1295-1299.
- Islam, M. S., C. Baker, P. Huxley, I. T. Russell and M. S. Dennis (2017) "The nature, characteristics and associations of care home staff stress and wellbeing: a national survey." *BMC Nursing* 16: 22.
- Juthberg, C. and K. Sundin (2010). "Registered nurses' and nurse assistants' lived experience of troubled conscience in their work in elderly care-A phenomenological hermeneutic study." *International Journal of Nursing Studies* 47(1): 20-29.
- Karasek, R. A. (1979). "Job Demands, Job Decision Latitude, and Mental Strain - Implications for Job Redesign." *Administrative Science Quarterly* 24(2): 285-308.
- Kuremyr, D., M. Kihlgren, A. Norberg, S. Astrom and I. Karlsson (1994). "Emotional Experiences, Empathy and Burnout among Staff Caring for Demented Patients at a Collective Living Unit and a Nursing-Home." *Journal of Advanced Nursing* 19(4): 670-679.
- Lake, E. T. (2007). "The nursing practice environment - Measurement and evidence." *Medical Care Research and Review* 64(2): 104s-122s.
- Larrabee, J. H., Y. Wu, C. A. Persily, P. S. Simoni, P. A. Johnston, T. L. Marcischak, C. L. Mott and S. D. Gladden (2010). "Influence of Stress Resiliency on RN Job Satisfaction and Intent to Stay." *Western Journal of Nursing Research* 32(1): 81-102.
- Livingston G , Barber J , Marston L , (2017). Prevalence of and associations with agitation in residents with dementia living in care homes: MARQUE cross-sectional study. *BJPsych Open* 3:171–8.
- Lucchetti, G., A. L. G. Lucchetti, G. R. Oliveira, D. Crispim, S. L. Pires, M. L. Gorzoni, C. R. G. Panicio and H. G. Koenig (2014). "Nursing home care: exploring the role of religiousness in the mental health, quality of life and stress of formal caregivers." *Journal of Psychiatric and Mental Health Nursing* 21(5): 403-413.
- Luppa, M., T. Luck, S. Weyerer, H. H. Konig, E. Brahler and S. G. Riedel-Heller (2010). "Prediction of institutionalization in the elderly. A systematic review." *Age and Ageing* 39(1): 31-38.
- Malach-Pines, A. (2008). "Stress and burnout: The significant difference." *Journal of Pediatric Hematology Oncology* 30(1): 109-109.

- Maslach, C. and S. E. Jackson (1981). "The Measurement of Experienced Burnout." *Journal of Occupational Behaviour* 2(2): 99-113.
- Maslach, C., et al. (2001). "Job burnout." *Annual Review of Psychology* 52: 397-422.
- McManus, I. C., B. C. Winder and D. Gordon (2002). "The causal links between stress and burnout in a longitudinal study of UK doctors." *Lancet* 359(9323): 2089-2090.
- Pejtersen, J. H., T. S. Kristensen, V. Borg and J. B. Bjorner (2010). "The second version of the Copenhagen Psychosocial Questionnaire." *Scandinavian Journal of Public Health* 38: 8-24.
- Pines, A. M. (2002). "A psychoanalytic-existential approach to burnout: Demonstrated in the cases of a nurse, a teacher, and a manager." *Psychotherapy* 39(1): 103-113.
- Pitfield, C., K. Shahriyarmolki and G. Livingston (2011). "A systematic review of stress in staff caring for people with dementia living in 24-hour care settings." *International Psychogeriatrics* 23(1): 4-9.
- Ribbe, M. W., G. Ljunggren, K. Steel, E. Topinkova, C. Hawes, N. Ikegami, J. C. Henrard and P. V. Jonnson (1997). "Nursing homes in 10 nations: a comparison between countries and settings." *Age and Ageing* 26: 3-12.
- Schaefer, J. A. and R. H. Moos (1996). "Effects of work stressors and work climate on long-term care staff's job morale and functioning." *Research in Nursing & Health* 19(1): 63-73.
- Schaufeli, W. G. and D. Vandierendonck (1995). "A Cautionary Note About the Cross-National and Clinical Validity of Cutoff Points for the Maslach-Burnout-Inventory (Vol 76, 1083, 1995)." *Psychological Reports* 77(1): U2-U2.
- Schmidt, S. G., M. N. Dichter, S. Bartholomeyczik and H. M. Hasselhorn (2014). "The satisfaction with the quality of dementia care and the health, burnout and work ability of nurses: A longitudinal analysis of 50 German nursing homes." *Geriatric Nursing* 35(1): 42-46.
- Schmidt, S. G., M. N. Dichter, R. Palm and H. M. Hasselhorn (2012). "Distress experienced by nurses in response to the challenging behaviour of residents - evidence from German nursing homes." *Journal of Clinical Nursing* 21(21-22): 3134-3142.
- Siegrist, J. (2002). "Adverse health effects of effort-reward imbalance - Applying the model to Eastern Europe." *Heart Disease: Environment, Stress and Gender* 327: 26-38.
- Tanaka, K., N. Iso, A. Sagari, A. Tokunaga, R. Iwanaga, S. Honda, H. Nakane, Y. Ohta and G. Tanaka (2015). "Burnout of Long-term Care Facility Employees: Relationship with Employees' Expressed Emotion Toward Patients." *International Journal of Gerontology* 9(3): 161-165.
- Testad, I., A. Mikkelsen, C. Ballard and D. Aarmland (2010). "Health and well-being in care staff and their relations to organizational and psychosocial factors, care staff and resident factors in nursing homes." *International Journal of Geriatric Psychiatry* 25(8): 789-797.
- Vogel, B., S. De Geest, K. Fierz, S. Beckmann and F. Zuniga (2017). "Dementia care worker stress associations with unit type, resident, and work environment characteristics: a cross-sectional secondary data analysis of the Swiss Nursing Homes Human Resources Project (SHURP)." *International Psychogeriatrics* 29(3): 441-454.

VonDras, D. D., D. Flittner, S. A. Malcore and G. Pouliot (2009). "Workplace Stress and Ethical Challenges Experienced by Nursing Staff in a Nursing Home." *Educational Gerontology* 35(4): 321-339.

Willemse, B. M., J. de Jonge, D. Smit, M. F. I. A. Depla and A. M. Pot (2012). "The moderating role of decision authority and coworker- and supervisor support on the impact of job demands in nursing homes: A cross-sectional study." *International Journal of Nursing Studies* 49(7): 822-833.

Willemse, B. M., J. De Jonge, D. Smit, Q. Visser, M. F. I. A. Depla and A. M. Pot (2015). "Staff's person-centredness in dementia care in relation to job characteristics and job-related well-being: a cross-sectional survey in nursing homes." *Journal of Advanced Nursing* 71(2): 404-416.

Woodhead, E. L., L. Northrop and B. Edelstein (2016). "Stress, Social Support, and Burnout Among Long-Term Care Nursing Staff." *Journal of Applied Gerontology* 35(1): 84-105.

Yada, H., H. Abe, X. Lu, Y. Wakizaki, H. Omori, H. Matsuo, Y. Ishida and T. Katoh (2014). "Job-related stress in psychiatric nurses in Japan caring for elderly patients with dementia." *Environmental Health and Preventive Medicine* 19(6): 436-443.

Zimmerman, S., C. S. Williams, P. S. Reed, M. Boustani, J. S. Preisser, E. Heck and P. D. Sloane (2005). "Attitudes, stress, and satisfaction of staff who care for residents with dementia." *Gerontologist* 45: 96-105.

Figure 1. PRISMA flow diagram of the systematic review

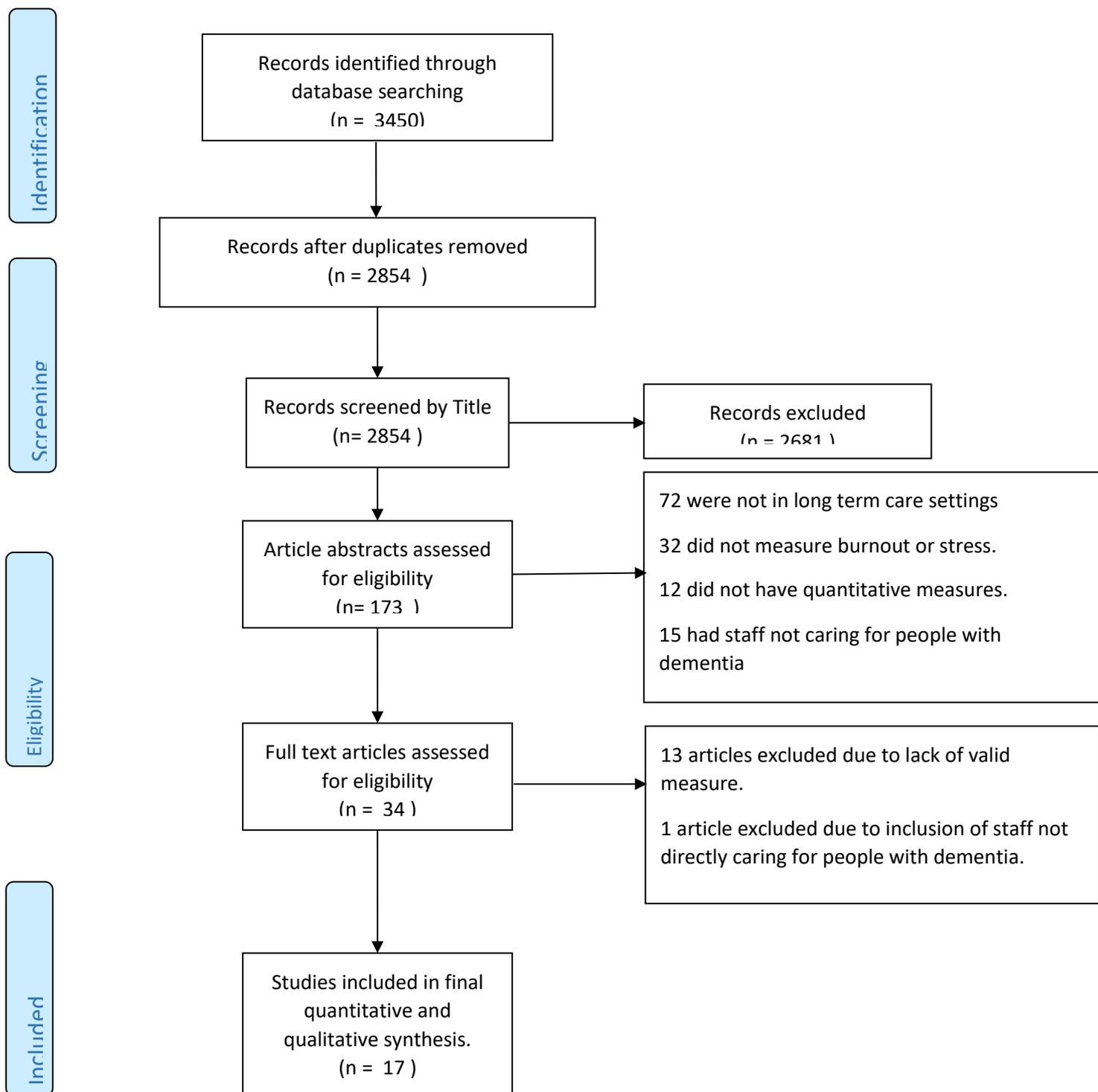


Table 1. Demographics and Validity Criteria scores of all included studies.

Study	Country	n	Response rate	Stress measure	Female staff %	Age (SD)	Staff role	Validity Criteria								Total
								1	2	3	4	5	6	7	8	
Barbosa et al. 2015	Portugal	58	86	MBI	100	44.62 (9)	Morning personal care staff	1	1	1	1	0.5	0.5	0	1	6
Chamberlain et al. 2017	Canada	1194	86	MBI (shortened)	92.46	40-49	Care aides.	0	1	0	1	1	1	0	1	5
De Rooij et al. 2012	Belgium & the Netherlands	80	43	UBOS	92.5	42.04	Professional caregivers'	1	1	0	1	1	1	0	1	6
Duffy et al. 2009	U.K	61	-	MBI	73.8	42.6 (14)	61.3% N, 30.6% NA, 6.5% manager.	1	1	0	1	1	1	0	1	6
Edvardsson et al. 2009	Sweden	344	88	SDCSQ	89.9	42.6 (12.1)	64.5% N, 35.5% personal care attendants.	1	0	1	1	0	1	0	0	4
Edvardsson et al. 2014	Sweden	171	-	SDCSQ	84	48 (9.1)	14% N, 72% NA, 1% health assistant, 13% no training.	1	0	0	1	0	1	1	0	4
Furumura et al. 2014	Japan	333	56	MBI	83.2	42.5 (13.4)		1	1	0	1	1	1	1	1	7
Gao et al. 2014	Australia	239	-	SF-36	92	49	N	1	0	0	1	1	1	1	1	6
Islam et al. 2017	U.K	212	54% of care homes	SF-12	85.9	40-49	35% Manager, 19% Team leader, 35% Carer/care assistant, 11% N.	1	1	0	1	1	1	1	1	7
Juthberg et al. 2010	Sweden	146	-	MBI	95.5	44.3	66% NA, 34% N.	0	0	0	1	1	1	0	1	4
Lucchetti et al. 2014	Brazil	105	61.7%	SF-36, BDI, BAI	81.6	41.6 (9.4)	NA	1	1	0	1	1	1	0	1	6
Schmidt et al. 2014	Germany	305	-	COPSOQ	86	42.8 (9.5)	N 68%, NA 32%.	1	1	0	1	0.5	0.5	0	1	5
Schmidt et al. 2012	Germany	731	45.40%	COPSOQ	86.9	41.9 (10.7)	65% N, 35% NA	1	1	0	1	0.5	0.5	0	1	5
Testad et al. 2009	Norway	198	98%	HSCL-10, PSS	95.4	43.1 (12.9)	12% NA, 87% N	1	1	1	1	0.5	0.5	0	1	6
Vogel et al. 2017	Switzerland	3922	-	HPSI	92.1	43 (12.4)	47% N, 51% NA other 3%.	1	1	1	1	0.5	0.5	1	1	7
Willemse et al. 2012	Belgium & the Netherlands	1093	59%	UBOS	95	43 (10.1)	'Predominantly NA'	1	1	0	1	1	1	0	1	6
Willemse et al. 2015	Belgium & the Netherlands	1093	59%	UBOS	94.7	43.2 (9.9)	NA 86%, N 14.2%	1	1	0	1	1	1	0	1	6

Swedish Demand-Control-Support Questionnaire (SDCS), 36-Item Short Form Survey (SF-36), 12 Item Short Form Survey (SF-12), Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI), Zarit Caregiver Burden Interview (ZBI), Hopkins Symptom Check List, 10 items (HSCL-10), Perceived Stress Scale (PSS), Health Professions Stress Inventory (HPSI), Maslach Burnout Inventory (MBI), Utrecht Burnout Scale (UBOS), Personal Burnout' scale of the Copenhagen Psychosocial Questionnaire (COPSOQ).. (N) Nurses, (NA) Nurse aides, (-) Not stated.

Table 2. Studies reporting mean burnout scores

Study	Sample	Measure	n	Response rate	Emotional exhaustion (EE)		Depersonalisation (DP)		Personal accomplishment (PA)	
					Mean (95% C.I)	EE level	Mean (95% C.I)	DP level	Mean (95% C.I)	PA level
Barbosa et al. 2015	4 residential care facilities, Portugal	MBI	58	86%	14.4 (12.08 - 16.67)	Low	6 (4.50 - 7.5)	Low	39.8 (38.08 - 41.50)	High
Chamberlain et al. 2017	30 nursing homes, Canada	MBI (shortened)	1194	86%	2.57 (2.48 - 2.66)	Moderate	2.23 (2.14 - 2.32)	Moderate	5.21 (5.16 - 5.26)	High
De Rooij et al. 2012	22 traditional & small scale care settings, Belgium & the Netherlands	UBOS	80	43%	1.42 (1.18 - 1.66)	Low	0.62 (0.47 to 0.77)	Low	4.7 (4.54 to 4.86)	High
Duffy et al. 2009	7 Dementia care homes, UK	MBI	61	-	26.7 (23.69 - 29.65)	Moderate	7.2 (5.72 - 8.66)	Moderate	32.6 (30.56 - 34.70)	Moderate
Furumura et al. 2014	32 Dementia nursing homes, Japan	MBI	333	56%	14.3 (13.77-14.83)	Low	11.2 (10.71-11.69)	Moderate	16.1 (15.6-16.6)	Low
Juthberg et al. 2010	Residential care, Sweden.	MBI	50 (nurses) 96 (nurse aides)	- -	19.3 (16.30 - 22.4) 17.8 (15.80 - 19.8)	Moderate Moderate	3.4 (2.4 - 4.6) 3.6 (2.8 - 4.5)	Low Low	38.4 (36.00 - 40.80) 39.6 (38.4 - 40.8)	Moderate High
Willemse et al. 2015	136 Dementia care facilities, the Netherlands	UBOS	1147	59%	1.59 (1.53 - 1.65)	Low	-	-	4.65 (4.61 - 4.69)	Moderate
Schmidt et al. 2014	51 nursing homes, Germany	COPSOQ	305	-	2007 (0-100): 42.7 (39.47 - 45.93), 2009: 49 (46.12-51.88)		5-point scale (almost never - everyday) of when staff felt 'worn out', 'emotionally exhausted', 'physically exhausted' or 'tired'. Transformed to range from 0-100. Higher scores = more severe burnout.			
Schmidt et al. 2012	56 nursing homes, Germany	COPSOQ	731	45.40%	43.9/100 (41.94-45.86)					

Maslach Burnout Inventory (MBI) - 22 items, EE (9 items), DP (5 items), PA (8 items) answered on a 7-point scale, ranging from 0 (never) to 6 (every day). Utrecht Burnout Scale (UBOS) - Dutch translation derived MBI. 20 items EE (8 items), DP (5 items), PA (7 items). MBI (shortened) - scoring cut offs provided by personal communication with author (Leiter) of MBI. Personal Burnout' scale of the Copenhagen Psychosocial Questionnaire (COPSOQ).
Not stated (-)

Table 3. Studies reporting mean stress scores

Study	Population	n	Stress measure	Mean score on measure (95% C.I)	Interpretation/Prevalence
Edvardsson et al. 2009	40 residential care units, Sweden.	346	SDCSQ	-	72.4% job required too high an effort, 67.5% experienced conflicting demands in their work, 72.7% did not have enough time to accomplish work.
Edvardsson et al. 2014	24 residential care units, Sweden	171	SDCSQ	Job strain demand 14.8/20, control 12.2/24, social support 10.8/24	4-point scale 1 (disagree) - 4 (agree). Higher scores = less strain. Job strain/demand 5 items, control 6 items, social support 6 items.
Gao et al. 2014	Residential aged care staff, Australia	239	SF-36	SF 36 (0-100): Mental health 70.7/100 (68.49 - 72.91), Role emotional 80.98 (77.93 - 84.03), Social function 83.5 (80.59-86.41), Vitality 49.89 (47.45 - 52.33)	Normative age matched female scores in Australia: 75.5 (0.6) Mental health, 84.0 (1.2) Role emotional, Social function 85.7 (0.6), Vitality 64.5 (0.7).
Islam et al. 2017	72 care homes, Wales	212	SF-12	SF-12 (0-100): Mental health 46.2/100 (45.44 - 46.96)	Normative scores for white British females. Mental health 47.74 (10.96)
Lucchetti et al. 2014	Nursing home, Brazil	105	SF-36, BDI, BAI	SF 36 (0-100): mental health 75.3, role emotional 82.5, vitality 67.9. BDI: 6.1 (5.98-6.27), BAI: 5.2 (5.07-5.34)	5.8% depressed, significant anxiety in 23.2% and significant stress in 38.0%. SF-36 normative age matched female scores in Brazil: mental health 83.8, role emotional 85.4, vitality 72.4
Testad et al. 2009	4 nursing homes, Norway	198	HSCL-10, PSS	HSCL-10: 13.25/40 (12.77 - 13.73), mean item score 1.33 (>1.85 = significant stress). PSS: 22.21/40 (21.35 - 23.07)	PSS: 10-item 5-point scale 0 (never) - 4 (very often). Higher scores = greater levels of perceived stress. HSCL-10: 10 items, 4-point scale, 1 (not at all) to 4 (extremely), >1.85 = valid indicator of psychological distress.
Vogel et al. 2017	156 nursing homes, Switzerland	3922	HPSI	HPSI (0-4): Conflict & lack of recognition: 0.9 (0.88-0.92). Workload: 1.5 (1.46 - 1.53). Lack of preparation: 0.7 (0.68-0.72).	12 items. five-point scale, 0 (never) to 4 (very often), higher scores = more frequent stress.

Swedish Demand-Control-Support Questionnaire (SDCS), 36-Item Short Form Survey (SF-36), 12 Item Short Form Survey (SF-12), Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI), Zarit Caregiver Burden Interview (ZBI), Hopkins Symptom Check List, 10 items (HSCL-10), Perceived Stress Scale (PSS), Health Professions Stress Inventory (HPSI).

Meta-analysis of Emotional Exhaustion Burnout Score

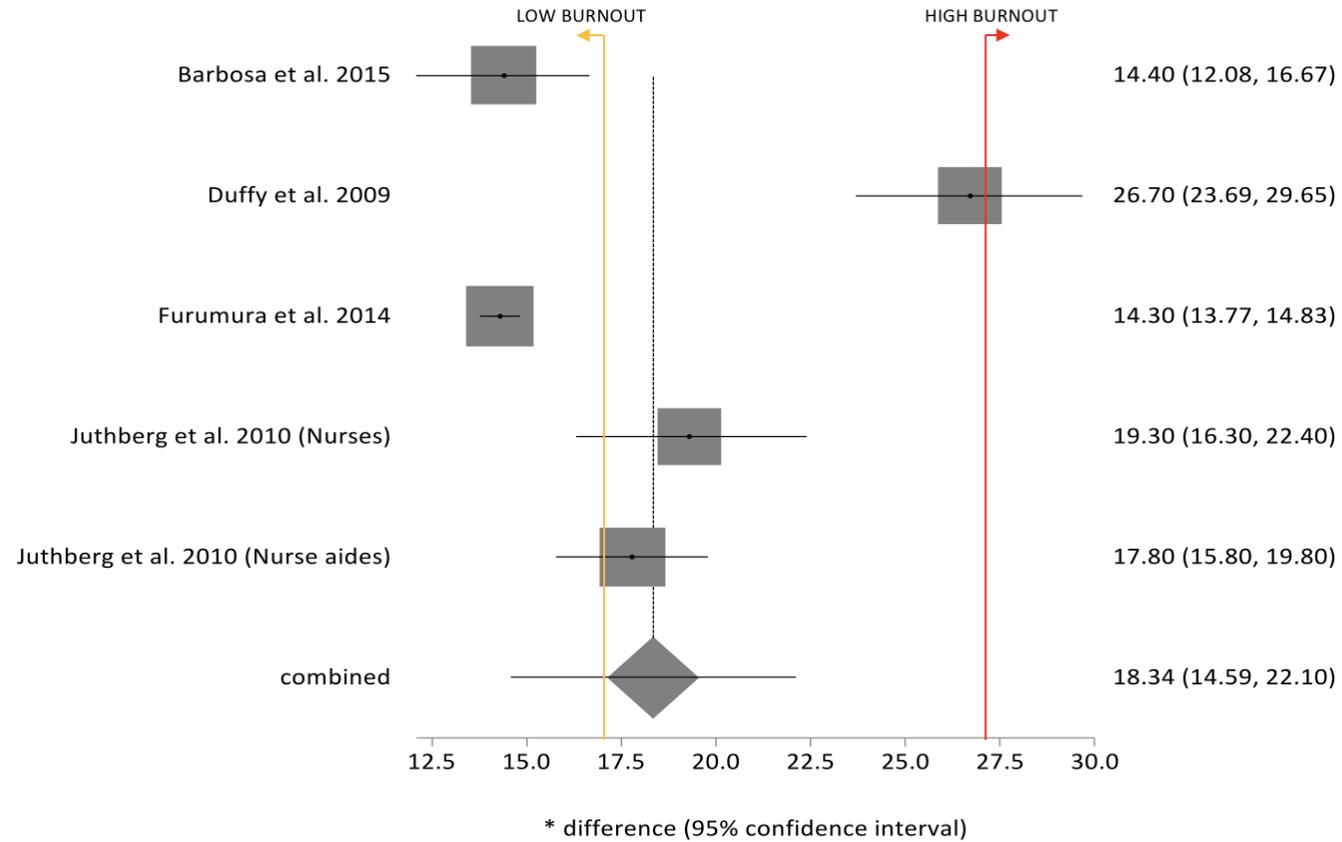


Figure 2.

Figure

Meta-analysis of Depersonalisation Burnout Score

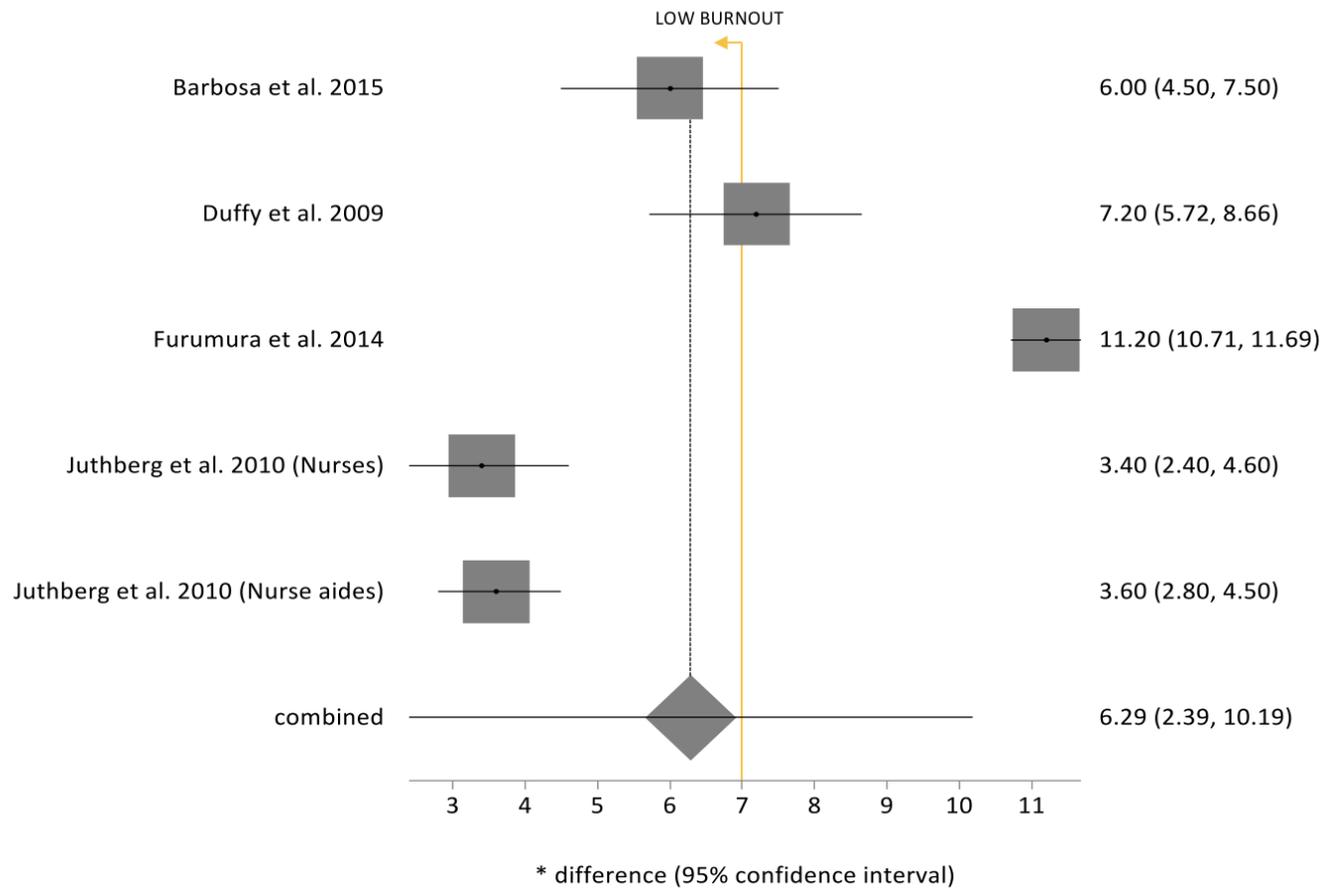


Figure 3.

Meta-analysis of Personal Accomplishment Burnout Score

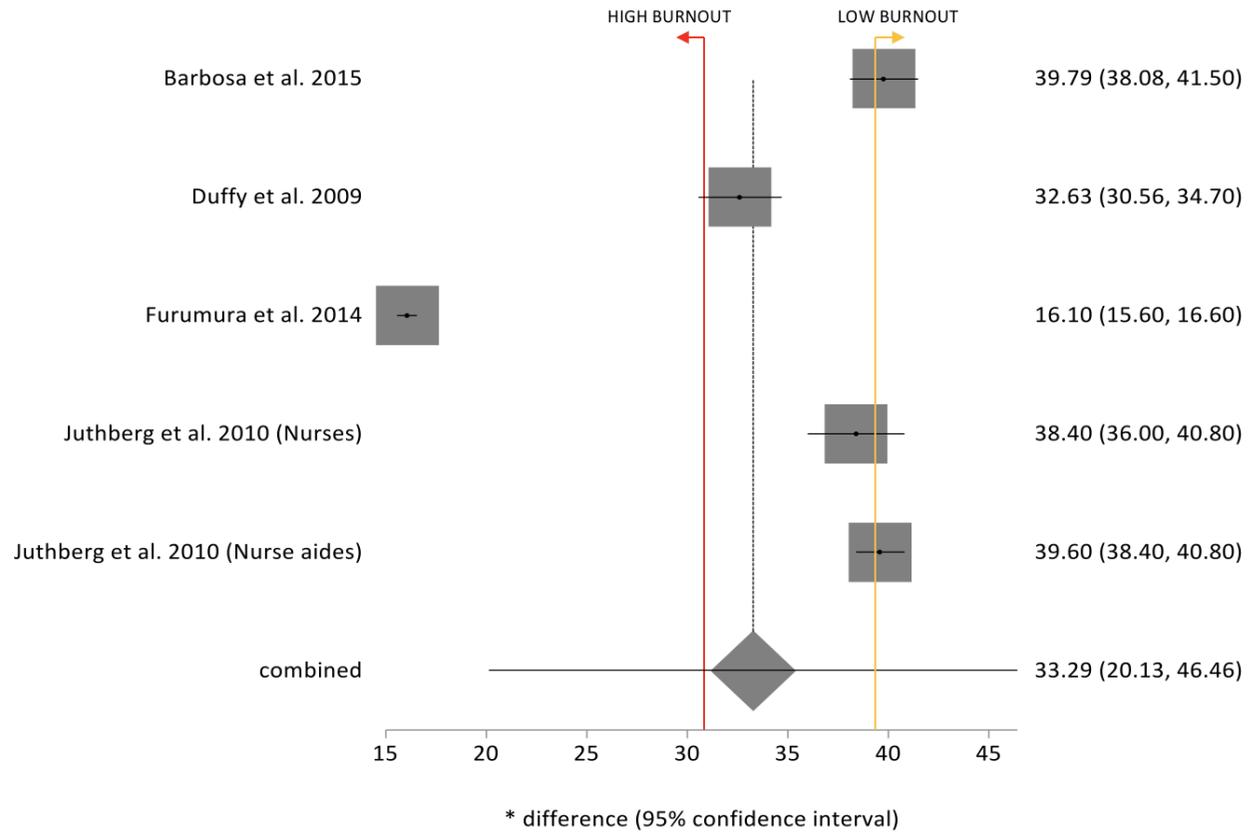


Figure. 4