The home care work environment's relationships with work engagement and burnout: A cross-sectional multi-center study in Switzerland

Nathalie Möckli MSc, RN [1], Kris Denhaerynck PhD, RN [1,2], Sabina De Geest PhD, RN[1,2], Lynn Leppla MSc, RN[1,3], Sonja Beckmann PhD, RN[1,4], Hannele Hediger lic. phil., RN[5], Franziska Zúñiga PhD, RN[1]

[1] Department of Public Health, Institute of Nursing Science, University of Basel, Bernoullistrasse 28, CH-4056 Basel, Switzerland

[2] Department of Public Health and Primary Care, Academic Center for Nursing and Midwifery, KU Leuven, Kapucijnenvoer 35 blok d, box 7001, B-3000 Leuven, Belgium

[3] Departments of Haematology and Oncology, University Hospital Freiburg, Hugstetter Str. 55, D-79106 Freiburg im Breisgau, Germany

[4] Center of Clinical Nursing Science, University Hospital Zurich, Rämistrasse 100, CH-8091 Zürich, Switzerland

[5] Department of Health, Zurich University of Applied Sciences (ZHAW), Technikumstrasse 81, CH-8400 Winterthur, Switzerland

Correspondence

Franziska Zúñiga, Head of Education, Department of Public Health, Institute of Nursing Science, University of Basel, Bernoullistrasse 28, CH-4056 Basel, Switzerland.
Email: franziska.zuniga@unibas.ch

Acknowledgments

The authors would like to thank the home care agencies participating in this study, fellow students at the University of Basel for supporting this research project and Chris Shultis for editing the manuscript.

Conflict of Interest statement

We have no conflict of interest to declare.

Funding Statement

This study was supported by a grant from the Stiftung Pflegewissenschaft Schweiz (Nursing Foundation of Switzerland) [ID 2121-2017]. The funding source was not involved in any part of the design, data analysis, or writing of this study report.

Abstract

This study aimed to investigate levels of burnout and work engagement among home care workers in Switzerland and to test their association with job demands and job resources.

We conducted a multi-center, cross- sectional survey in the German-speaking part of Switzerland with a convenience sample of seven home care agencies. Data were collected between September 2017 and January 2018. We assessed burnout with the Maslach Burnout Inventory (MBI) and work engagement with the Utrecht Work Engagement Scale (UWES) as well as job demands (overtime, work-family conflicts, experienced aggression, work stressors) and job resources (predictability, staffing, teamwork, leadership, collaboration, social support, sense of community, feedback). To investigate levels of burnout and work engagement we applied descriptive statistics. Based on Baker and colleagues' Job Demands-Resources model, we used a path analysis to test the associations of job demands and job resources with burnout and work engagement. We analyzed data from 448 home care workers (response rate 61.8%, mean age 44 years (SD 13.2), 96% female).

The frequency of burnout in our sample was low, while that of work engagement was high. Job demands correlated positively with emotional exhaustion ($\beta = .54$, $p < .001$) and negatively with work engagement ($\beta = -.25$, $p < .001$). Job resources correlated negatively with emotional exhaustion ($\beta = -.28$, $p < .001$) and positively with work engagement ($\beta = .41$, $p < .001$). Work-family conflicts and work stressors correlated strongest with emotional exhaustion, whereas social support and feedback were found to correlate strongest with work engagement.

Improvements to the home care work environment might enhance work engagement and reduce burnout. Corrective interventions could focus on reducing specific aspects of job demands, such as work-family conflicts and work stressors, as well as on increasing aspects of job resources, especially social support and feedback.

Key words: Burnout, Professional; Home Care Services; Job Demands-Resources Model; Occupational Stress; Work Engagement; Work Environment

What is already known about this topic?

- Work engagement keeps nurses in their professions, while burnout is related to thoughts of leaving health care.
- Burnout frequency differs considerably between countries and we know little about the frequency of work engagement in home care workers.
- The work environment plays a key role in personnel outcomes including burnout and work engagement; however, studies have focused mainly on institutional settings.

What this paper adds:

- We found high levels of work engagement and low levels of burnout among Swiss home care workers.
- Feedback and job-related social support showed strong positive associations with work engagement.
- Work stressors and work-family conflicts showed strong positive associations with emotional exhaustion.

Introduction

The aging population, rising chronic conditions and shortened lengths of hospital stay are increasingly shifting patient care to home care settings (Oulton, 2006, OECD, 2015, Merçay et al., 2016). As a result, in many countries, current projections indicate that patients' needs, especially in home care, will soon overtake care workers' capacity to handle them (OECD, 2015, Merçay et al., 2016). Home care here refers to any nursing or domestic task performed by formal care workers at a client's own home. This predicted shortage of nursing personnel will likely be aggravated by high turnover rates (Simoens et al., 2005, OECD, 2015) and early exit from nursing as a profession (Lobsiger and Kägi, 2016).

Current evidence suggests that thoughts of leaving the nursing profession increase due to elevated levels of burnout (Hasselhorn et al., 2003, Jourdain and Chênevert, 2007, Heinen et al., 2013) — an outcome in which negative work environment factors play a key role (Heinen et al., 2013, Li et al., 2013, Van Bogaert et al., 2013, Cooper et al., 2016, Aronsson et al., 2017, Jarrín et al., 2017). Conversely, positive work environment factors correlate with higher work engagement (Naruse et al., 2013, Maurits et al., 2015, Vander Elst et al., 2016). However, most studies of work environment outcomes focus on institutional settings. As home care differs substantially from institutional care, these results cannot simply be transferred. Home care workers' work environment is more isolated: they perform their duties alongside informal caregivers in clients' homes, on a non-continuous basis. They also have limited support when facing problems during home visits; and as they generally have few (if any) office hours, they have little personal contact with their counterparts in other locations, meaning fewer opportunities for informal information exchange (Flynn and Deatrick, 2003, Ellenbecker et al., 2008). Nevertheless, in addition to working with informal caregivers and patients, home care is highly interprofessional, demanding collaboration, for example, with general practitioners, social workers, and hospitals (Genet et al., 2012a). To address workforce problems, it is crucial to increase our understanding of the home care work environment, including which of its aspects correlate with such outcomes as burnout and work engagement. Considering the differences between institutional and home care settings, we expect home care-specific work environment factors to be related to staff outcomes**.**

Job demands-resources (JD-R) model

The Job Demands-Resources (JD-R) model conceptualizes the work environment's relationships with burnout and work engagement via two mutually counteractive forces (Demerouti et al., 2001, Bakker and Demerouti, 2007). On one side, chronic job demands deplete employees' resources, which can lead to burnout - a breakdown of functional capacity resulting from extended unsuccessful adaption to job stress (Schaufeli et al., 1993) . *Job demands* are understood as structural, psychological, social or physical aspects of a job that require physical, cognitive and emotional skills to fulfill necessary tasks (Demerouti et al., 2001, Bakker et al., 2005). They differ in

each workplace and are not per se negative, but may become stressors if they outstrip employees' capacity to cope with them (Demerouti et al., 2001, Bakker et al., 2003a, Bakker et al., 2005).

Opposing job demands, job resources have a motivating effect and lead to high work engagement (Bakker and Demerouti, 2007). *Job resources* refer to structural, psychological, social or physical aspects of a work environment. They operate in three different ways: they reduce job demands and the corresponding psychological and physical abrasion, they act as stimuli for personal growth and development; or they support the achievement of work targets (Demerouti et al., 2001, Bakker et al., 2005). Work engagement includes three dimensions: vigor, dedication and absorption (Maslach et al., 2001). Vigor is seen as the willingness to put effort into one's work, to be energetic, resilient, and persistent in facing difficulties; dedication involves strong involvement and a sense of enthusiasm about one's work; and absorption is the capacity to immerse oneself with joy into one's work (Maslach et al., 2001).

Empirical evidence shows that job resources moderate the effect of job demands regarding burnout (Bakker et al., 2005, Xanthopoulou et al., 2007), while job demands moderate the relationship between job resources and work engagement (Bakker et al., 2007). According to the JD-R model, high job demands cause burnout only when job resources are low, whereas the relationship between high job resources and high work engagement can be reduced by high job demands (Bakker et al., 2003a). Building on former job stress models, the JD-R model expanded their scope to include job-specific demands and resources (Demerouti et al., 2001, Bakker and Demerouti, 2007). Hence, for this study, we used Bakker et al.'s JD-R model (2014, p. 400), applying a combination of home care-specific job demands (e.g. work stressors) and resources (e.g. feedback, support) as shown in figure 1.

[please insert here Figure 1]

Job demands and burnout in home care

In the home care setting burnout prevalence ranges from about 13% in Belgium (Vander Elst et al., 2016) to 36% in Canada (Denton et al., 2002). Confirming burnout's strong link with job demands, studies in the home care setting have shown that job demands, e.g., heavy workload, experience of aggressive behaviors (Vander Elst et al., 2016), on-call tasks, paperwork overload, poor work-life balance (Naruse et al., 2012), time pressure (Jansen et al., 1996, Naruse et al., 2012) and anxiety at clients' homes all increased burnout levels.

Job resources and work engagement in home care

To date, few studies have measured the prevalence of work engagement in home care. However, Vander Elst et al. (2016) reported that 86% of home care nurses in Belgium feel engaged at work at least once a week. In addition, Maurits et al. (2015) found that among home care workers in the Netherlands such engagement correlated with decreased thoughts of leaving the healthcare sector. A small number of studies assessed work engagement in relation to the work environment in the home

care setting, indicating that supervisor and colleague support correlated positively and significantly with higher work engagement (Naruse et al., 2013, Vander Elst et al., 2016), as did higher self-perceived autonomy (Maurits et al., 2015), a positive relationship between work and family (Naruse et al., 2013), and more learning opportunities (Vander Elst et al., 2016).

The above-cited empirical evidence indicates both that burnout prevalence differs considerably between countries and that we know little about the prevalence of work engagement in home care workers. Considering the speed at which home care's importance is growing and that work engagement keeps nurses in their professions, while burnout is related to thoughts of leaving health care, a better understanding is needed regarding both burnout and work engagement rates in home care. Although various studies have assessed specific aspects of the home care work environment in relation to burnout, few have examined its relationship to work engagement. The exploration of further job demands and resources with burnout and work engagement, such as teamwork, predictability or staffing, would be valuable to better understand the home care work environment. The identification of modifiable burnout- and work engagement-related work environment factors may help home care management and policy makers enhance those factors, thereby reducing home care workers' burnout and fostering their work engagement.

Aims

This study had two principle aims:

(1) to investigate the levels of burnout and work engagement among home care workers in Switzerland, and
(2) to investigate the job demands' and job resources' associations with burnout and work engagement in home care workers.

Specifically, based on the empirical evidence cited above, the following four hypotheses — which we tested, in accordance to the JD-R model (Demerouti et al., 2001, Bakker et al., 2014) (outlined in Figure 1), using a single model — guided our analyses:

(1) Job demands are positively related to burnout and negatively related to work engagement.
(2) Job resources are negatively related to burnout and positively related to work engagement.
(3) Job demands moderate the relationship between job resources and work engagement.
(4) Job resources moderate the relationship between job demands and burnout.

Methods

Design

The SPOT (SPitex quality of work environment pilOT) study was a multi-centre, cross-sectional pilot survey in the Swiss home care setting to test the feasibility of a national survey.

Sample/Participants

Switzerland has around 970 home care agencies, two-fifths of which are non-profit and cover four-fifths of all services (Bundesamt für Statistik, 2017). We conducted a two-stage sampling approach, using a convenience sample of seven variously-sized home care agencies located in both rural and urban areas in the German-speaking part of Switzerland that were known by or recommended to the research team. As our inclusion criterion, an agency had to have at least ten salaried employees. Within each participating home care agency, every home care worker, performing either nursing care or domestic tasks, with or without leadership functions, who had been employed at least one month at the participating agency and working an average of ≥ 8 hours per week was included.

Measures

Dependent variables

To measure *burnout*, two of the three original (German version) Maslach Burnout Inventory (MBI) subscales (Maslach and Jackson, 1981, Maslach, 1982) were used (c.f. table 1). These are recommended by Schaufeli and Taris (2005) to measure two core dimensions of burnout: emotional exhaustion (9 items) and depersonalization (5 items). Emotional exhaustion is described as feeling drained and no longer capable of contributing anything or of being emotionally involved; depersonalization refers to feeling uncaring and detached, or even harboring negative feelings and attitudes toward clients (Maslach, 1982, Maslach et al., 2001).

W*ork engagement* was measured via the 9-item German short version of the Utrecht Work Engagement Scale (UWES) (c.f. table 1). This version of the UWES includes three items on each of three major aspects of work engagement (vigor, dedication and absorption) (Schaufeli and Bakker, 2003). The high correlations between the three subscales (.65–.90) allows the calculation of an overall work engagement score (Schaufeli and Bakker, 2003). As our sample's subscale correlation coefficients were also strong (vigor/dedication r = .75; vigor/absorption r = .75; dedication/absorption r = .83), an overall mean score was calculated.

Independent variables

Job demands and job resources

Where possible, we used previously validated instruments (e.g., the Copenhagen Psychosocial Questionnaire, Safety Attitude Questionnaire); where none were available (e.g., to assess home care-specific job demands and resources), we developed our own. Variables used had been identified as important home care work environment factors in previous studies and by home care expert opinions (Flynn and Deatrick, 2003, Ellenbecker et al., 2006). Detailed information on the measurements used to assess independent variables can be found in table 1.

To measure *work stressors*, we constructed a home care-specific questionnaire based on the Health Professions Stress Inventory (HPSI) (Wolfgang, 1988), as no corresponding published questionnaires were found. Items were defined via home care nursing expert opinions, home care worker focus groups and a review of literature on job demands in the home care setting (Boswell,

1992, Walcott-McQuigg and Ervin, 1992, Stewart and Arklie, 1994, Murray, 1998, Snelgrove, 1998, Tholdy Doncevic et al., 1998, Rout, 2000, Evans, 2002, Salmond and Ropis, 2005, Samia et al., 2012). We tested the newly built items' content validity in a two-stage process using two groups of seven home care nurse experts. For each item, a content validity index (I-CVI) and a modified kappa (*k*) were calculated (Polit et al., 2007). Items with poor I-CVIs (*k* below .40) were removed. Seven final items with I-CVIs between .75 and .94 (cut-off for excellent: .74) and *k* values between .67 and 1.00 were included in this analysis. For the self-developed stressors scale a principal component analysis with varimax rotation was conducted (n = 375) (Gaskin and Happell, 2014). Based on eigenvalues, this showed a single-factor solution, explaining 57% of variance, with factor loadings ranging between .80 – .75. Therefore, the mean across all items was calculated, with lower values indicating les frequent work stressors (Cronbach's alpha = 0.74).

For the self-developed *collaboration* items, a principal component analysis was conducted (n = 339) (Jolliffe, 1986). The eigenvalues produced indicated a single-factor solution, explaining 57% of variance with factor loadings ranging between .72 and .80, we chose to assign binary weights to the items, scoring with the mean of the 5 items, with a higher value indicating more effective collaboration (Cronbach's alpha = 0.80).

[please insert Table 1 here]

Demographic variables

Employee characteristics of interest included gender, age, employment percentage, experience in profession and in current home care agency, job position, usual shift (day / evening / night / split shift) and educational background. The latter included five groups: (1) nurses with university/college degree (MSN or equivalent); (2) registered nurses (RNs) qualified to conduct needs assessment and coaching sessions (BSN or at least a 3-year education with diploma); (3) nurses qualified to provide basic care needs, with additional clinical competencies, corresponding to licensed practical nurses (LPNs); (4) nurses qualified to provide basic care needs with no additional clinical competencies, corresponding to certified nurse assistants (CNAs); and (5) basic health care assistants (nurse aides (NAs)).

Organizational variables

Organizational characteristics of interest were profit status (for-profit, non-profit), size, catchment area (rural, suburban, urban), range of services (nursing care, domestic task), number of full-time equivalent posts for nurses of each educational background, number of personnel in service at the time of data collection and perceptions regarding recruitment of qualified nursing personnel.

Procedures

Data collection took place between September 2017 and January 2018 via self-administered employee and agency questionnaires. The agency questionnaire was filled out by the home care agency management and submitted either electronically (via email) or as paper documents. The

presorted employee questionnaires were sent to the study contact persons at the participating home care agencies for internal distribution to the respective employees. Each employee questionnaire included a prepaid reply envelope and written information explaining that their participation was voluntary, that their data would be kept confidential and that returning the completed questionnaire was considered informed consent. To encourage participation, we recommended allocating time during working hours for the employees to fill out the questionnaires. So that the employees could be reminded about the survey if the response rate was low, we informed the study contact persons of their institutions' overall response rates three and six weeks after the start of data collection.

Ethical considerations

A declaration of no objection was obtained from the Ethics Commission of Northwest and Central Switzerland. Each home care agency provided written informed consent to participate in the study.

Data analysis

Data analyses were performed using R 3.4.3 statistical software (R Development Core Team, 2017) and SAS® 9.4 analytical software (SAS institute, Cary NC). As appropriate, descriptive statistics were generated to calculate frequencies, percentages, means and standard deviations, as well as to check distribution characteristics, including outliers and floor and ceiling effects.

Spearman's rank correlation coefficients of the study variables were calculated. To test the various job resources' relative contributions to work engagement and burnout, partial correlations – controlled for job demands – were calculated. The same was done for the various job demands, controlling for job resources. To test our model, which depicts job demands' and job resources' relationships with burnout and work engagement, a path analysis was applied (Stage et al., 2004). This required a minimum sample size-to-parameter ratio of 20:1 (Stage et al., 2004), which was surpassed with a ratio of 48:1. To adjust for the non-normal distribution of the dependent variables, they were transformed (via logarithmic transformation for the right-skewed emotional exhaustion and square root transformation for the left-skewed work engagement). Because we used factor scores of an orthogonally rotated principal component analysis to estimate the latent constructs of 'job demands' and 'job resources' — which were independent — their covariance did not need to be estimated.

Model fit was evaluated with a chi-square test, standardized root mean square residual (SRMR), adjusted Goodness of Fit Index (AGFI), Root Mean Square Error of Approximation (RMESA), Bentler Comparative Fit Index (CFI) and Normed Fit Index (NFI). We expected a non-significant chi-square test result with an α-level for significance set at 0.05, an SRMR value below .05, the AGFI above the threshold of .90, RMESA below .06 and CFI and NFI values greater than respectively .95 and .90, indicating a good model fit (Bentler and Bonett, 1980, Hu and Bentler, 1999, Hooper et al., 2008). Moderation effects of the predictors were examined by testing their interaction products. Confounding factors, all of which were selected based on literature (Arts et al.,

1999, Iordanou et al., 2009, Naruse et al., 2012, Naruse et al., 2013, Lavoie-Tremblay et al., 2014), were not added to the final model; however, their possible effects on the estimates/inferences of the two predictor variables on both outcomes were examined in two separate general linear models.

Missing values were deleted listwise. A sensitivity analysis was performed by substituting missing values using the R software package's Multivariate Imputation by Chained Equations (MICE) package (van Buuren and Groothuis-Oudshoorn, 2011). While listwise deletion assumes missingness completely at random, MICE assumes missingness conditionally, based on other variables in the data set. It randomly samples observed values and regresses them on the other variables, after which the obtained equation is used to impute the missing entries. We used the classification and regression tree regressors, averaging our imputations over 5 imputed data sets.

Results

Organizational characteristics

All seven home care agencies were non-profit organizations. One covered rural, four suburban and two urban catchment areas. Their size ranged from 19 to 249 employees performing nursing or domestic tasks with full-time equivalent posts between 8.7 and 129.9 (*median*: 38.8). All agencies' ranges of service included nursing care and domestic tasks. All reported recruiting registered nurses to be rather or very difficult.

Respondent characteristics

Of 472 home care workers completed the questionnaire (response rate 61.8%), 448 fulfilled the inclusion criteria and could be included in data analysis (three worked < 8 hours a week; 21 performed neither nursing care nor domestic tasks). The mean age of respondents was 43.6 years (*SD* = 13.15) with the majority being female. Further demographic characteristics are shown in table 2.

[please insert here Table 2]

Intraclass correlation was calculated to assess whether the grouping of participants within organizations affected answer distribution (ICC(1)) as well as the reliability of group means (ICC(2)). We expected values below the threshold of .05 for ICC(1) and below .70 for ICC(2) (LeBreton and Senter, 2008, Koo and Li, 2016). This was achieved with respective values of .03 and .44 for emotional exhaustion and of .03 and .41 for work engagement; therefore, no hierarchical modeling was applied.

Frequency of work engagement and burnout

On average, respondents' work engagement scores were high: the majority (76.5%) felt engaged at work at least once a week (74.8% vigor, 83.0% dedication, 71.2% absorption); and only 4.0% felt engagement once a month or less. The average burnout levels were low. The majority (83.7%) of respondents felt emotionally exhausted once a month or less, with only 1.6% feeling emotionally exhausted at least once a week. The vast majority (97.8%) felt depersonalized once a month or less; none felt depersonalized once a week or more; and 35.0% never experienced feelings of depersonalization. The depersonalization subscale was excluded from further analysis due to absence of variability (excessive kurtosis and highly (left-) skewed distribution).

Test of the hypotheses

Table 3 shows the mean, standard deviation and Cronbach's α of each analyzed study variable. As can be seen from the table, almost all showed acceptable internal consistency, i.e., a Cronbach's α above .70. The exceptions were feedback (.61) and staffing (.69), which were assessed with only two and three items respectively. Except for the job demand item on overtime and the job resource item on feedback, respondents rated their job demands rather low and their job resources high.

[please insert here Table 3]

When testing specific job resources' relative contributions (controlled for job demands) to outcomes, all but one — predictability — showed both significant positive relationships to work engagement (WE) ($p \leq .001$) and significant negative relationships to emotional exhaustion (EE) ($p \leq .002$). Predictability showed no significant relationship to emotional exhaustion ($r = -.02$, $p = .67$). In descending order, work engagement's strongest positive correlations were with social support (WE: $r = .41$; EE: $r = -.31$), then feedback (WE: $r = .40$), followed closely by collaboration (WE: $r = .38$; EE: $r = -.32$). When controlling for job resources, all job demands contributed significantly (either positively or negatively) ($p \leq .008$) to both outcomes. Among contributors to exhaustion, the highest positive correlations were with work-family conflicts (WE: $r = -.35$; EE: $r = .52$) and work stressors (EE: $r = .46$).

As seen in the correlation matrix below (table 4), there was a significant negative correlation between work engagement and emotional exhaustion ($r = -.50$), and highly significant correlations (p-value <.001) among almost all independent study variables. Because of the latter, variables constituting job demands and job resources were subjected to a varimax-rotated principal component analysis, resulting in two uncorrelated latent variables, both of which showed factor loadings with their original variables ranging between .57 and .71 for job demands and between .54 and .83 for job resources (cf. table 4). Cross loadings were negative or approached zero.

Results of our standardized path modeling are presented in figure 2. *Hypothesis 1*, that job demands are related positively to burnout and negatively to work engagement, was supported. Both the unstandardized (b) and standardized (β) path solution showed significant positive associations between job demands and emotional exhaustion ($b1 = 0.40$ (CI 95%: 0.34; 0.46), $SE = 0.03$; $\beta 1 = .54$ (0.48; 0.60), $SE = 0.03$, $p < .001$) and significant negative associations with work engagement ($b3 = -2.22$ (-3.04; -1.40), $SE = 0.42$; $\beta 3 = -.25$ (-0.35; -0.15), $SE = 0.05$, $p < .001$). *Hypothesis 2*, that job resources are related negatively to burnout and positively to work engagement, was also supported. Job resources were associated positively with work engagement ($b2 = 3.63$ (2.82; 4.45), $SE = 0.42$; $\beta 2 = .41$ (0.33; 0.49), $SE = 0.04$, $p < .001$) and negatively with emotional exhaustion ($b4 = -0.21$ (-0.27; -0.15), $SE = 0.03$; $\beta 4 = -.28$ (-0.36; -0.20), $SE = 0.04$, $p < .001$). However, the findings supported neither *Hypothesis 3 nor Hypothesis 4*, as the interaction effect of job demands x job resources was not significant either for emotional exhaustion ($\beta = .05$ (-0.05; 0.15), $SE = 0.05$, $p = .24$) or for work engagement ($\beta = -.009$ (-0.11; 0.09), $SE = 0.05$, $p = .86$) (not shown).

The final model (figure 2) showed good model fit (SRMR = .02, AGFI = 1.00, RMESA =. 00, CFI = 1.00, NFI = 1.00). R^2 values showed that the combination of job demands and job resources explained 37% of the variability of emotional exhaustion and 23% of that of work engagement.

[please insert here Figure 2]

None of the candidate confounders (age, gender, job position, employment percentage, working domain, leadership functions, experience in profession and agency), significantly affected

the conclusions of the final model; nor did substitution of missing values using multivariate imputation **(cf. supplementary material).**

Discussion

The frequency of burnout in our home care sample was low, while work engagement was high. One possible explanation is a selection bias in our sample, i.e., non-participation by home care workers with high levels of burnout or low levels of work engagement. However, Vander Elst et al. (2016) found comparable results in the setting of Belgian home care. Likewise, high levels of work engagement have been found in hospitals in the U.S. and the Netherlands (Benders et al., 2017, Havens et al., 2018). However, burnout levels seem to be lower in home care than in hospital settings (Aiken et al., 2012, Dhaini et al., 2018). This observation is supported by Matziari et al. (2017), who compared nurses working in hospitals with those providing care in other settings. One possible explanation for this difference is that home care nurses are able to work more independently and autonomously, to build up long-term relationships with their clients and have more flexible work schedules (Flynn and Deatrick, 2003, Cameron et al., 2004, Ellenbecker et al., 2006). Higher perceived autonomy has been linked negatively with burnout and positively with work engagement (Maurits et al., 2015, Vander Elst et al., 2016). Dhaini et al. (2018) found that a flexible work schedule correlated with less emotional exhaustion in hospital nurses.

Among the job resources measured here, job related social support and feedback showed the highest relative contributions to work engagement. In contrast, work-family conflicts and work stressors contributed most to emotional exhaustion. To our knowledge, this study is the first to measure the relationship between feedback and work engagement (Keyko et al., 2016): the results suggest that feedback is an important factor of the home care work environment. The importance of social support as a job resource is supported by several studies (Bakker et al., 2003b, Naruse et al., 2013, Vander Elst et al., 2016). As home care workers mostly work unaccompanied, we suggest that, compared to having constant direct contact with a care team, working alone in the field increases the importance not only of feeling supported by colleagues and supervisors (e.g., regarding emergencies, problems with clients), but also of receiving adequate feedback from them. Feedback, as an opportunity for improvement, should be specific and focus on the task rather than on the worker (Archer, 2010). Motley and Dolansky (2015) suggest five steps for effective feedback in clinical settings, including the creation of a feedback culture and encouragement for discussions. Regular team meetings and case discussions could help to enhance effective feedback within the home care team.

Previous research examining job resources and job demands support our findings — showing, for example, that work-family conflicts correlate not only positively with burnout and negatively with work engagement, but also negatively with job satisfaction and intention to stay in the profession (Naruse et al., 2013, Nei et al., 2015, Moloney et al., 2017, Tourangeau et al., 2017).

In a profession still predominantly staffed by women, promoting a work-family balance (e.g., via flexible scheduling) could help to retain nurses in home care (Cloninger et al., 2015).

The work stressor scale shows the importance of considering specific aspects of the home care work environment, e.g., time pressure while commuting, which Naruse et al. (2012) linked to higher emotional exhaustion. Considering the results described above, we regard regular assessment of key factors of emotional exhaustion and engagement as vital to the planning and development of interventions targeting the home care work environment.

This study's results support the comprehensive JD-R model, which is being applied increasingly in nursing and home care studies (Jang et al., 2017, Matziari et al., 2017, Ravenswood et al., 2018). Contrary to other studies (Bakker et al., 2003b, Bakker et al., 2005, Bakker et al., 2007, Xanthopoulou et al., 2007) but congruent with that of Jang et al. (2017), we found no significant moderation effects of job resources or job demands respectively either on emotional exhaustion or on work engagement. Possible reasons include the fact that in our sample environment, job demands were low and job resources high, whereas studies with significant moderation effects tend to focus mainly on settings where both job resources and job demands are high (Hakanen et al., 2005, Bakker et al., 2007).

Our participants' descriptive characteristics were similar to those of studies in other health care settings, but with a higher percentage of women and a higher mean age (Maurits et al., 2015, Jang et al., 2017). With 42% of home care workers over 50 years of age, the percentage of older workers was considerably higher than in Switzerland's overall nursing workforce (31.5%), its nursing homes (33%) or its hospitals (11.5%) (Dhaini et al., 2016, Lobsiger and Kägi, 2016, Dhaini et al., 2018). This difference may reflect a greater attraction among younger nurses to acute-care hospital work as opposed to work with elderly, chronically ill patients (Rognstad et al., 2004, Toren et al., 2011). Buerhaus et al. (2017) found a similar proportion of older care workers in the U.S., with 40% of registered nurses aged over 50 years working in non-hospital settings, but also a much higher percentage (30%) working in hospitals. The aging of the nursing workforce and the difficulty involved in recruiting registered nurses depicts the situation of many western countries, where nursing shortages are either present or predicted (Simoens et al., 2005). Once again, this highlights the importance of nurse retention.

Limitations

This study has several limitations. Due to the cross-sectional study design, no cause–effect inferences are possible. It should be noted that our study sample was only from the German-speaking part of Switzerland and involved only non-profit home care agencies, who cannot deny services to clients and therefore may yield greater fluctuation in client volume and higher work organization requirements (Bundesamt für Statistik, 2017). Due to known quality of care differences (e.g., safety) between the non-profit and for-profit sector in nursing homes, as has been shown for

the United Kingdom (Barron and West, 2017), and differences in emotional exhaustion depending on the profit status in other settings (Hansen et al., 2009), we do not exclude the possibility that the results might be different if the for-profit sector were included in the study. However, we will be able to assess this in a national study currently in preparation based on this pilot study. In addition, not only diverse concepts of "home care" (Genet et al., 2012b) but also substantially different health care systems exist internationally (World Health Organization, 2000). Therefore, no international generalizations can be made. Our convenience sampling method for home care agencies, voluntary participation of care workers, self-reported data and the exclusion of long-term ill home care workers due to their absence from work may have constituted selection bias. It should also be considered that sensitive questions (e.g., leadership, collaboration) might have elicited responses biased toward social desirability. And while individual (e.g., personality, coping strategies) and organizational factors (e.g., ownership model) were not considered, they may have mediated the interaction between job demands, job resources, burnout and work engagement. These are factors that might be included in further research, e.g. employees' ability to relax and unwind after work or the profit status of the home care agency. Also, unassessed, untested moderators could have led to confounding. Finally, the work stressors and collaboration scale were newly developed will require further validation.

Finally, although missing values resulted in a notable cumulative sample loss in the final analysis, their total number was not large; therefore, the proportion of imputed values was relatively small.

Conclusion

With an eye toward future care requirements, considering the high average age of home care workers and intense difficulties in recruiting registered nurses, enhancing the nurse work environment to retain staff in the home care setting should be a top priority. By encouraging the inclusion and analysis of specific work environment aspects, the JD-R model ensures their consideration (Bakker and Demerouti, 2016), which is proving necessary in the home care setting to identify key intervention aspects. Considering the results presented here, which link key work environment factors significantly with both burnout and work engagement, it is recommended that home care management seek out feasible means to foster and maintain a positive work environment. One promising system aimed at achieving these goals is the Pathway to Excellence Program®, which gives accreditation for work environments that enable nurses to master key skills in clinical practice and patient care (American Nurses Credentialing Center (ANCC), 2018). The program is comprised of six pathway standards (e.g., safety, leadership, well-being), each of which corresponds to a target aspect of a positive work environment. Such programs' positive patient and nurse outcomes, such as improved patient safety and staff retention, have so far been tested mainly in hospital settings (Kutney-Lee et al., 2015); however, Jarrín et al. (2017) showed that comparable advantages could also be achieved in home care.

Our findings provide a basis for the development of home care intervention to improve staff retention — possibly focusing on reducing work stressors and work-family conflicts (e.g., more flexible working hours), and/or on increasing social support and feedback (e.g., introduction of regular opportunities for exchange such as team meetings and case discussions). Further studies could evaluate such interventions' effectiveness regarding personnel and organizational outcomes across a broad spectrum of home care agencies with the goal of attracting and maintaining the workforce needed to meet the challenges of future home care.

References

Aiken, L. H., Sermeus, W., Van Den Heede, K., et al. (2012). Patient safety, satisfaction, and quality of hospital care: cross sectional surveys of nurses and patients in 12 countries in Europe and the United States. *BMJ: British Medical Journal,* 344. doi:10.1136/bmj.e1717

American nurses credentialing center (Ancc). 2018. *ANCC Pathway to Excellence® program* [Online]. ANCC Website. Available: http://nursecredentialing.org/ [Accessed 03.06 2018].

Archer, J. C. (2010). State of the science in health professional education: effective feedback. *Medical Education,* 44**,** 101-108. doi:10.1111/j.1365-2923.2009.03546.x

Aronsson, G., Theorell, T., Grape, T., et al. (2017). A systematic review including meta-analysis of work environment and burnout symptoms. *BMC Public Health,* 17**,** 264. doi:10.1186/s12889-017-4153-7

Arts, S. E. J., Kerkstra, A., Van Der Zee, J. & Abu-Saaf, H. H. (1999). Workload, capacity for coping and psychological and physical outcomes amongst home helps in the Netherlands. *Health & Social Care in the Community,* 7**,** 79-90. doi:0.1046/j.1365-2524.1999.00167.x

Bakker, A. B. & Demerouti, E. (2007). The job demands-resources model: State of the art. *Journal of Managerial Psychology,* 22**,** 309-328. doi:10.1108/02683940710733115

Bakker, A. B. & Demerouti, E. (2016). Job demands-resources theory: Taking stock and looking forward. *Journal of Occupational Health Psychology*. doi:10.1037/ocp0000056

Bakker, A. B., Demerouti, E. & Euwema, M. C. (2005). Job resources buffer the impact of job demands on burnout. *Journal of Occupational Health Psychology,* 10**,** 170-80. doi:10.1037/1076-8998.10.2.170

Bakker, A. B., Demerouti, E. & Sanz-Vergel, A. I. (2014). Burnout and work engagement: The JD–R approach. *Annual Review of Organizational Psychology and Organizational Behavior,* 1**,** 389-411. doi:10.1146/annurev-orgpsych-031413-091235

Bakker, A. B., Demerouti, E. & Schaufeli, W. B. (2003a). Dual processes at work in a call centre: An application of the job demands–resources model. *European Journal of Work and Organizational Psychology,* 12**,** 393-417. doi:10.1080/13594320344000165

Bakker, A. B., Demerouti, E., Taris, T. W., Schaufeli, W. B. & Schreurs, P. J. G. (2003b). A multigroup analysis of the job demands-resources model in four home care organizations. *International Journal of Stress Management,* 10**,** 16-38. doi:10.1037/1072-5245.10.1.16

Bakker, A. B., Hakanen, J. J., Demerouti, E. & Xanthopoulou, D. (2007). Job resources boost work engagement, particularly when job demands are high. *Journal of Educational Psychology,* 99**,** 274. doi:10.1037/0022-0663.99.2.274

Barron, D. N. & West, E. (2017). The quasi-market for adult residential care in the UK: Do for-profit, not-for-profit or public sector residential care and nursing homes provide better quality care? *Social Science & Medicine,* 179**,** 137-146. doi:https://doi.org/10.1016/j.socscimed.2017.02.037

Benders, J., Bleijerveld, H. & Schouteten, R. (2017). Continuous improvement, burnout and job engagement: a study in a Dutch nursing department. *The International Journal of Health Planning and Management,* 32**,** 481-491. doi:10.1002/hpm.2355

Bentler, P. M. & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin,* 88**,** 588.

Boswell, C. A. (1992). Work stress and job satisfaction for the community health nurse. *Journal of Community Health Nursing,* 9**,** 221-7. doi:10.1207/s15327655jchn0904_3

Buerhaus, P. I., Skinner, L. E., Auerbach, D. I. & Staiger, D. O. (2017). State of the registered nurse workforce as a new era of health reform emerges. *Nursing Economics,* 35**,** 229-237.

Bundesamt füR statistik 2017. Hilfe und Pflege zu Hause. Switzerland: BFS aktuell.

Büssing, A. & Perrar, K.-M. (1992). Die Messung von Burnout. Untersuchung einer deutschen Fassung des Maslach Burnout Inventory (MBI-D). *Diagnostica,* 38(4)**,** 328-353.

Cameron, S., Armstrong-Stassen, M., Bergeron, S. & Out, J. (2004). Recruitment and retention of nurses: challenges facing hospital and community employers. *Nursing Leadership (Toronto, Ont.),* 17**,** 79-92.

Cloninger, P. A., Selvarajan, T. T., Singh, B. & Huang, S. (2015). The mediating influence of work–family conflict and the moderating influence of gender on employee outcomes. *The*

International Journal of Human Resource Management, 26**,** 2269-2287. doi:10.1080/09585192.2015.1004101

Cooper, S. L., Carleton, H. L., Chamberlain, S. A., Cummings, G. G., Bambrick, W. & Estabrooks, C. A. (2016). Burnout in the nursing home health care aide: A systematic review. *Burnout Research,* 3**,** 76-87. doi:10.1016/j.burn.2016.06.003

Demerouti, E., Bakker, A. B., Nachreiner, F. & Schaufeli, W. B. (2001). The job demands-resources model of burnout. *Journal of Applied Psychology,* 86**,** 499-512. doi:10.1037/0021-9010.86.3.499

Denton, M., Zeytinoglu, I. U., Davies, S. & Lian, J. (2002). Job stress and job dissatisfaction of home care workers in the context of health care restructuring. *International Journal of Health Services,* 32**,** 327-357. doi:10.2190/VYN8-6NKY-RKUM-L0XW

Dhaini, S. R., Denhaerynck, K., Bachnick, S., Schwendimann, R., Schubert, M., De Geest, S. & Simon, M. (2018). Work schedule flexibility is associated with emotional exhaustion among registered nurses in Swiss hospitals: A cross-sectional study. *International Journal of Nursing Studies,* 82**,** 99-105. doi:10.1016/j.ijnurstu.2018.03.019

Dhaini, S. R., Zúñiga, F., Ausserhofer, D., Simon, M., Kunz, R., De Geest, S. & Schwendimann, R. (2016). Care workers health in Swiss nursing homes and its association with psychosocial work environment: a cross-sectional study. *International Journal of Nursing Studies,* 53**,** 105-115. doi:10.1016/j.ijnurstu.2015.08.011

Ellenbecker, C. H., Boylan, L. N. & Samia, L. (2006). What home healthcare nurses are saying about their jobs. *Home Healthcare Nurse,* 24**,** 315-24. doi:10.1097/00004045-200605000-00010

Ellenbecker, C. H., Samia, L., Cushman, M. J. & Alster, K. 2008. Patient safety and quality in home health care. *In:* Hughes R.G. (ed.) *Patient Safety and Quality: An Evidence-Based Handbook for Nurses.* Rockville (MD): Agency for Healthcare Research and Quality (US).

Evans, L. (2002). An exploration of district nurses' perception of occupational stress. *British Journal of Nursing* 11**,** 576-85. doi:10.12968/bjon.2002.11.8.10167

Flynn, L. & Deatrick, J. A. (2003). Home care nurses' descriptions of important agency attributes. *Journal of Nursing Scholarship,* 35**,** 385-390. doi:10.1111/j.1547-5069.2003.00385.x

Gaskin, C. J. & Happell, B. (2014). On exploratory factor analysis: a review of recent evidence, an assessment of current practice, and recommendations for future use. *International Journal of Nursing Studies,* 51**,** 511-21. doi:10.1016/j.ijnurstu.2013.10.005

Genet, N., Boerma, W., Kroneman, M., Hutchinson, A. & Saltman, R. B. (eds.) 2012a. *Home care across Europe: Current structure and future challenges,* Copenhagen: World Health Organization.

Genet, N., Boerma, W., Kroneman, M., Hutchinson, A. & Saltman, R. B. (2012b). *Home care across Europe. Current structure and future challenges,* Copenhagen, WHO, Regional Office for Europe (on behalf of the European Observatory on Health Systems and Policies).

Green, D. E., Walkey, F. H. & Taylor, A. J. (1991). The three-factor structure of the Maslach Burnout Inventory: A multicultural, multinational confirmatory study. *Journal of Social Behavior and Personality,* 6**,** 453-472.

Hakanen, J. J., Bakker, A. B. & Demerouti, E. (2005). How dentists cope with their job demands and stay engaged: The moderating role of job resources. *European Journal of Oral Sciences,* 113**,** 479-487. Retrieved from https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1600-0722.2005.00250.x

Hansen, N., Sverke, M. & Näswall, K. (2009). Predicting nurse burnout from demands and resources in three acute care hospitals under different forms of ownership: A cross-sectional questionnaire survey. *International Journal of Nursing Studies,* 46**,** 96-107. doi:https://doi.org/10.1016/j.ijnurstu.2008.08.002

Hasselhorn, H.-M., Tackenberg, P. & Müller, B. (2003). Working conditions and intent to leave the profession among nursing staff in Europe. Retrieved from https://www.researchgate.net/publication/242742550_Work_Conditions_and_Intent_to_Leave_the_Profession_Among_Nursing_Staff_in_Europe

Havens, D. S., Gittell, J. H. & Vasey, J. (2018). Impact of relational coordination on nurse job satisfaction, work engagement and burnout: Achieving the quadruple aim. *Journal of Nursing Administration,* 48**,** 132-140. doi:10.1097/NNA.0000000000000587

Heinen, M. M., Van Achterberg, T., Schwendimann, R., et al. (2013). Nurses' intention to leave their profession: A cross sectional observational study in 10 European countries. *International Journal of Nursing Studies,* 50**,** 174-184. doi:10.1016/j.ijnurstu.2012.09.019

Hooper, D., Coughlan, J. & Mullen, M. R. (2008). Structural equation modelling: Guidelines for determining model fit. *Electronic Journal of Business Research Methods,* 6**,** 53-60.

Hu, L.-T. & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal,* 6**,** 1-55. doi:10.1080/10705519909540118

Iordanou, P., Koutavas, S., Koulierakis, G., Babatsikou, F., Kroustalli, E. & Tarpatzi, K. (2009). Syndrome of professional burnout in home service for elderly. *Health Science Journal,* 3**,** 232-241. doi:10.1155/2012/490647

Jang, Y., Lee, A. A., Zadrozny, M., Bae, S.-H., Kim, M. T. & Marti, N. C. (2017). Determinants of job satisfaction and turnover intent in home health workers: The role of job demands and resources. *Journal of Applied Gerontology,* 36**,** 56-70. doi:10.1177/0733464815586059

Jansen, P. G., Kerkstra, A., Abu-Saad, H. H. & Van Der Zee, J. (1996). The effects of job characteristics and individual characteristics on job satisfaction and burnout in community nursing. *International Journal of Nursing Studies,* 33**,** 407-21. doi:10.1016/0020-7489(95)00060-7

Jarrín, O. F., Kang, Y. & Aiken, L. H. (2017). Pathway to better patient care and nurse workforce outcomes in home care. *Nursing Outlook,* 65**,** 671-678. doi:10.1016/j.outlook.2017.05.009

Jolliffe, I. T. (1986). *Principal component analysis and factor analysis. In: Principal component analysis,* New York, NY, Springer Series in Statistics. Springer.

Jourdain, G. & Chênevert, D. (2007). Burnout among nursing staff and intention to leave the profession: Validation of the job demands-resource model in hospitals in Québec. Paper presented at the ASAC, Ottawa, Ontario.

Keyko, K., Cummings, G. G., Yonge, O. & Wong, C. A. (2016). Work engagement in professional nursing practice: A systematic review. *International Journal of Nursing Studies,* 61**,** 142-164. doi:10.1016/j.ijnurstu.2016.06.003

Koo, T. K. & Li, M. Y. (2016). A guideline of selecting and reporting intraclass correlation coefficients for reliability research. *Journal of Chiropractic Medicine,* 15**,** 155-163. doi:10.1016/j.jcm.2016.02.012

Kutney-Lee, A., Stimpfel, A. W., Sloane, D. M., Cimiotti, J. P., Quinn, L. W. & Aiken, L. H. (2015). Changes in patient and nurse outcomes associated with magnet hospital recognition. *Medical Care,* 53**,** 550-557. doi:10.1097/MLR.0000000000000355

Lake, E. T. (2002). Development of the practice environment scale of the Nursing Work Index. *Research in Nursing & Health,* 25**,** 176-188. doi:10.1002/nur.10032

Lavoie-Tremblay, M., Trépanier, S.-G., Fernet, C. & Bonneville-Roussy, A. (2014). Testing and extending the triple match principle in the nursing profession: A generational perspective on job demands, job resources and strain at work. *Journal of Advanced Nursing,* 70**,** 310-322. doi:10.1111/jan.12188

Lebreton, J. M. & Senter, J. L. (2008). Answers to 20 questions about interrater reliability and interrater agreement. *Organizational Research Methods,* 11**,** 815-852. doi:10.1177/1094428106296642

Li, B., Bruyneel, L., Sermeus, W., Van Den Heede, K., Matawie, K., Aiken, L. & Lesaffre, E. (2013). Group-level impact of work environment dimensions on burnout experiences among nurses: A multivariate multilevel probit model. *International Journal of Nursing Studies,* 50**,** 281-291. doi:10.1016/j.ijnurstu.2012.07.001

Lobsiger, M. & Kägi, W. 2016. Analyse der Strukturerhebung und Berechnung von Knappheitsindikatoren zum Gesundheitspersonal (Obsan Dossier 53). Neuchâtel: Schweizerisches Gesundheitsobservatorium.

Maslach, C. (1982). *Burnout: The cost of caring,* Engelwood Cliffs, NY, Prentice- Hall.

Maslach, C. & Jackson, S. E. (1981). The measurement of experienced burnout. *Journal of Organizational Behavior,* 2**,** 99-113. doi:10.1002/job.4030020205

Maslach, C., Schaufeli, W. B. & Leiter, M. P. (2001). Job burnout. *Annual Review of Psychology,* 52**,** 397-422. doi:10.1146/annurev.psych.52.1.397

Matziari, A., Montgomery, A. J., Georganta, K. & Doulougeri, K. (2017). The relationship between organizational practices and values with burnout and engagement. *Current Psychology,* 36**,** 276-285. doi:10.1007/s12144-016-9413-7

Maurits, E. E., De Veer, A. J., Van Der Hoek, L. S. & Francke, A. L. (2015). Autonomous home-care nursing staff are more engaged in their work and less likely to consider leaving the healthcare sector: a questionnaire survey. *International Journal of Nursing Studies,* 52**,** 1816-23. doi:10.1016/j.ijnurstu.2015.07.006

Merçay, C., Burla, L. & Widmer, M. 2016. Gesundheitspersonal in der Schweiz. Bestandesaufnahme und Prognosen bis 2030 (Obsan Bericht 71). Neuchâtel: Schweizerisches Gesundheitsobservatorium.

Moloney, W., Boxall, P., Parsons, M. & Cheung, G. (2017). Factors predicting registered nurses' intentions to leave their organization and profession: A job demands-resources framework. *Journal of Advanced Nursing*. doi:10.1111/jan.13497

Motley, C. L. & Dolansky, M. A. (2015). Five steps to providing effective feedback in the clinical setting: A new approach to promote teamwork and collaboration. *Journal of Nursing Education,* 54**,** 399-403. Retrieved from https://www.healio.com/nursing/journals/jne/2015-7-54-7/%7B9c13a5d0-2131-4f3b-8629-59251f9d428f%7D/five-steps-to-providing-effective-feedback-in-the-clinical-setting-a-new-approach-to-promote-teamwork-and-collaboration.pdf

Murray, T. A. (1998). From outside the walls: a qualitative study of nurses who recently changed from hospital-based practice to home health care nursing. *Journal of Continuing Education in Nursing,* 29**,** 55-60. doi:10.3928/0022-0124-19980301-06

Naruse, T., Sakai, M., Watai, I., Taguchi, A., Kuwahara, Y., Nagata, S. & Murashima, S. (2013). Individual and organizational factors related to work engagement among home-visiting nurses in Japan. *Japan Journal of Nursing Science,* 10**,** 267-72. doi:10.1111/jjns.12003

Naruse, T., Taguchi, A., Kuwahara, Y., Nagata, S., Watai, I. & Murashima, S. (2012). Relationship between perceived time pressure during visits and burnout among home visiting nurses in Japan. *Japan Journal of Nursing Science,* 9**,** 185-194. doi:10.1111/j.1742-7924.2011.00201.x

Nei, D., Snyder, L. A. & Litwiller, B. J. (2015). Promoting retention of nurses: A meta-analytic examination of causes of nurse turnover. *Health Care Management Review,* 40**,** 237-53. doi:10.1097/hmr.0000000000000025

Netemeyer, R. G., Boles, J. S. & Mcmurrian, R. (1996). Development and validation of work–family conflict and family–work conflict scales. *Journal of Applied Psychology,* 81**,** 400-410. doi:10.1037/0021-9010.81.4.400

Nübling, M., Stößel, U., Hasselhorn, H.-M., Michaelis, M. & Hofmann, F. (2006). Measuring psychological stress and strain at work-Evaluation of the COPSOQ Questionnaire in Germany. *GMS Psycho-Social Medicine,* 3.

Oecd (2015). *Health at a glance 2015: OECD indicators,* Paris, OECD Publishing.

Oulton, J. A. (2006). The global nursing shortage: an overview of issues and actions. *Policy, Politics & Nursing Practice,* 7**,** 34s-39s. doi:10.1177/1527154406293968

Polit, D. F., Beck, C. T. & Owen, S. V. (2007). Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. *Research in Nursing & Health,* 30**,** 459-467. doi:10.1002/nur.20199

Ravenswood, K., Douglas, J. & Haar, J. (2018). Physical and verbal abuse, work demands, training and job satisfaction amongst aged-care employees in the home and community sector. *Labour & Industry: A Journal of the Social and Economic Relations of Work***,** 1-17. doi:10.1080/10301763.2018.1427846

Rognstad, M.-K., Aasland, O. & Granum, V. (2004). How do nursing students regard their future career? Career preferences in the post-modern society. *Nurse Education Today,* 24**,** 493-500. doi:10.1016/j.nedt.2004.07.015

Rout, U. R. (2000). Stress amongst district nurses: a preliminary investigation. *Journal of Clinical Nursing,* 9**,** 303-309. doi:10.1046/j.1365-2702.2000.00342.x

Salmond, S. & Ropis, P. E. (2005). Research for practice. Job stress and general well-being: A comparative study of medical-surgical and home care nurses. *MEDSURG Nursing,* 14**,** 301-309. Retrieved from https://insights.ovid.com/medsurg-nursing/mednu/2005/10/000/job-stress-general/7/00008484

Samia, L. W., Ellenbecker, C. H., Friedman, D. H. & Dick, K. (2012). Home care nurses' experience of job stress and considerations for the work environment. *Home Health Care Services Quarterly,* 31**,** 243-265. doi:10.1080/01621424.2012.703903

Schaufeli, W. B. & Bakker, A. B. (2003). *Utrecht work engagement scale: Preliminary manual,* Utrecht University, Utrecht, Occupational Health Psychology Unit.

Schaufeli, W. B., Maslach, C. & Marek, T. (eds.) 1993. *Historical and conceptual development of burnout,* Philadelphia, PA, US: Taylor & Francis.

Schaufeli, W. B. & Taris, T. W. (2005). The conceptualization and measurement of burnout: Common ground and worlds apart The views expressed in Work & Stress Commentaries are those of the author(s), and do not necessarily represent those of any other person or organization, or of the journal. *Work & Stress,* 19**,** 256-262. doi:10.1080/02678370500385913

Schwendimann, R., Zúñiga, F., Ausserhofer, D., Schubert, M., Engberg, S. & Geest, S. (2014). Swiss Nursing Homes Human Resources Project (SHURP): protocol of an observational study. *Journal of Advanced Nursing,* 70**,** 915-926. doi:10.1111/jan.12253

Sermeus, W., Aiken, L. H., Van Den Heede, K., et al. (2011). Nurse forecasting in Europe (RN4CAST): rationale, design and methodology. *BMC Nursing,* 10**,** 6. doi:10.1186/1472-6955-10-6

Sexton, J. B., Helmreich, R. L., Neilands, T. B., et al. (2006). The Safety Attitudes Questionnaire: Psychometric properties, benchmarking data, and emerging research. *BMC Health Services Research,* 6**,** 44. doi:10.1186/1472-6963-6-44

Simoens, S., Villeneuve, M. & Hurst, J. (2005). *Tackling nurse shortages in OECD countries. OECD Health Working Papers, No. 19,* Paris, OECD Publishing.

Snelgrove, S. R. (1998). Occupational stress and job satisfaction: a comparative study of health visitors, district nurses and community psychiatric nurses. *Journal of Nursing Management,* 6**,** 97-104. doi:10.1046/j.1365-2834.1998.00055.x

Stage, F. K., Carter, H. C. & Nora, A. (2004). Path analysis: An introduction and analysis of a decade of research. *The Journal of Educational Research,* 98**,** 5-13. doi:10.3200/JOER.98.1.5-13

Stewart, M. J. & Arklie, M. (1994). Work satisfaction, stressors and support experienced by community health nurses. *Canadian Journal of Public Health,* 85**,** 180-4.

Tholdy Doncevic, S., Romelsjo, A. & Theorell, T. (1998). Comparison of stress, job satisfaction, perception of control, and health among district nurses in Stockholm and prewar Zagreb. *Scandinavian Journal of Social Medicine,* 26**,** 106-14. doi:10.1177/14034948980260021001

Toren, O., Zelker, R. & Porat, N. (2011). Preferences of Israeli nursing students in choosing their future workplace. *Journal of Nursing Management,* 20**,** 45-55. doi:10.1111/j.1365-2834.2011.01255.x

Tourangeau, A. E., Patterson, E., Saari, M., Thomson, H. & Cranley, L. (2017). Work-related factors influencing home care nurse intent to remain employed. *Health Care Management Review,* 42**,** 87-97. doi:10.1097/hmr.0000000000000093

Van Bogaert, P., Kowalski, C., Weeks, S. M., Van Heusden, D. & Clarke, S. P. (2013). The relationship between nurse practice environment, nurse work characteristics, burnout and job outcome and quality of nursing care: A cross-sectional survey. *International Journal of Nursing Studies,* 50**,** 1667-1677. doi:10.1016/j.ijnurstu.2013.05.010

Van Buuren, S. & Groothuis-Oudshoorn, K. (2011). mice: Multivariate imputation by chained equations in R. *Journal of Statistical Software,* 45**,** 1-67. Retrieved from http://www.jstatsoft.org/v45/i03/.

Vander Elst, T., Cavents, C., Daneels, K., Johannik, K., Baillien, E., Van Den Broeck, A. & Godderis, L. (2016). Job demands-resources predicting burnout and work engagement

among Belgian home health care nurses: A cross-sectional study. *Nursing Outlook*. doi:10.1016/j.outlook.2016.06.004

Walcott-Mcquigg, J. A. & Ervin, N. E. (1992). Stressors in the workplace: community health nurses. *Public Health Nursing,* 9**,** 65-71. doi:10.1111/j.1525-1446.1992.tb00074.x

Wolfgang, A. P. (1988). The Health Professions Stress Inventory. *Psychological Reports,* 62**,** 220-222. doi:10.2466/pr0.1988.62.1.220

World health organization (2000). *The world health report 2000: health systems: improving performance,* Geneva, World Health Organization.

Xanthopoulou, D., Bakker, A. B., Demerouti, E. & Schaufeli, W. B. (2007). The role of personal resources in the job demands-resources model. *International Journal of Stress Management,* 14**,** 121-141. doi:10.1037/1072-5245.14.2.121

Zimmermann, N., Küng, K., Sereika, S. M., Engberg, S., Sexton, B. & Schwendimann, R. (2013). Assessing the safety attitudes questionnaire (SAQ), German language version in Swiss university hospitals - a validation study. *BMC Health Services Research,* 13**,** 347. doi:10.1186/1472-6963-13-347

Tables

Table 1. Measurements for dependent and independent variables

Variables	Instrument used (Reference)	Number of items (Anchor of answer options) Scale calculation / Cronbach's α	Meaning of score	Example of items
Dependent variables				
Burnout	MBI (Maslach and Jackson, 1981, Maslach, 1982)	14 (0 = never, 6 = every day) Mean score for each subscale / .53 for depersonalization, .89 for emotional exhaustion (Büssing and Perrar, 1992)	higher values indicating higher levels of emotional exhaustion or depersonalization	Frequency of experiencing personal attitudes and feelings about the job and clients
Work engagement	UWES-9 (Schaufeli and Bakker, 2003)	9 (0 = never, 6 = every day) Mean over all items / .90	higher values indicating higher levels of work engagement	"I'm proud on the work I do."
Independent variables				
Job demands				
Overtime	from previous studies (SHURP, RN4Cast) (Sermeus et al., 2011, Schwendimann et al., 2014)	1 (1 = never, 5 = almost every shift) N/A	higher values indicating higher amount of overtime	How often do you have to work overtime more than 30 minutes?
Work stressors	adapted from HPSI and self-developed (Wolfgang, 1988)	7 (0 = never, 4 = very often, with answer option "not within my field of responsibility")	lower values indicating lower work stress	How often do you feel stressed because you have to make critical on-spot decisions at clients' homes?
Experienced aggression	adapted from previous study (SHURP) (Schwendimann et al., 2014)	1 (0 = never, 6 = daily) N/A	lower values indicating less experienced aggression	How often have you experienced verbally aggressive behavior of clients towards home care staff in the last year?
Work-family conflicts	COPSOQ (Netemeyer et al., 1996, Nübling et al., 2006)	5 (0 = disagree, 4 = fully agree) mean over all items / .92	lower values indicating lower experienced psychosocial strain	"My job produces strain that makes it difficult to fulfill family duties."
Job resources				
Predictability	COPSOQ (Nübling et al., 2006)	2 (4 = To a very high degree, 0 = to a very small degree) mean over all items / .75	higher values indicating lower experienced psychosocial strain	Do you receive all the information you need in order to do your work well?
Collaboration	adapted from previous study (SHURP) and self-developed (Schwendimann et al., 2014)	5 (1 = very low, 4 = very high, with answer option "don't know")	higher values indicating more effective collaboration	At your work place, how is the collaboration with doctors?
Staffing	PES-NWI (Lake, 2002)	3 (1 = strongly disagree, 4 = strongly agree) mean over all items / .74	higher values indicating higher staffing adequacy	"There is enough staff to get the work done."

Variables	Instrument used (Reference)	Number of items (Anchor of answer options) Scale calculation / Cronbach's α	Meaning of score	Example of items
Social support	COPSOQ (Nübling et al., 2006)	4 (0 = never, 4 = always, with answer option "don't have a superior/ colleagues") mean over all items / .80	higher values indicating lower experienced psychosocial strain	How often do you get help and support from your colleagues?
Sense of community	COPSOQ (Nübling et al., 2006)	3 (0 = never, 4 = always, with answer option "don't have a superior/ colleagues") mean over all items / .79	higher values indicating lower experienced psychosocial strain	Is there a good atmosphere between you and your colleagues?
Leadership	PES-NWI (Lake, 2002)	5 (1 = strongly disagree, 4 = strongly agree) mean over all items / 0.84 in SHURP	higher values indicating better performing leadership	"Supervisors use mistakes as learning opportunities, not criticism."
Teamwork	SAQ (Sexton et al., 2006, Zimmermann et al., 2013)	7 (1 = don't agree, 5 = agree) mean over all items / .67	higher values indicating better teamwork	"Input is well received in this team."
Feedback	COPSOQ (Nübling et al., 2006)	2 (0 = never, 4 = always, with answer option "don't have a superior/ colleagues") mean over all items / .58	higher values indicating lower experienced psychosocial strain	How often do your colleagues talk with you about how well you carry out your work?

Note. COPSOQ = Copenhagen Psychosocial Questionnaire, HPSI = Health Professions Stress Inventory, MBI = Maslach Burnout Inventory, N/A = not applicable, PES-NWI = Nursing Work Index's Practice Environment Scale, RN4Cast = Nurse Forecasting: Human Resources Planning in Nursing, SAQ = Safety Attitude Questionnaire, SHURP = Swiss Nursing Homes Human Resources Project, UWES = Utrecht Work Engagement Scale

Table 2. Descriptive statistics for respondents' characteristics (n = 448)

Variables	*n*	Frequency	missing *n* (%)
Gender			5 (1.1%)
Female	424	95.7%	
Male	19	4.3%	
Age			8 (1.8%)
< 30 years	85	19.3%	
≥ 30 years < 50 years	165	37.5%	
≥ 50 years	190	43.2%	
Educational level			6 (1.3%)
University/ college degree	41	9.3%	
Registered nurse	168	38.0%	
Licensed practical nurse	133	30.1%	
Certified assistant nurse/ nurse aides	69	15.6%	
Other	31	7.0%	
Experience in profession			
Overall			30 (6.7%)
≤ 5 years	82	19.6%	
> 5 years ≤ 10 years	77	18.4%	
> 10 years ≤ 20 years	135	32.3%	
> 20 years	124	29.7%	
In current agency			25 (5.6%)
≤ 2 years	139	32.9%	
> 2 years ≤ 5 years	112	26.5%	
> 5 years ≤ 10 years	69	16.3%	
> 10 years	103	24.3%	
Job position			6 (1.3%)
Domestic tasks only	45	10.2%	
Nursing tasks only	343	77.6%	
Both	54	12.2%	
Usual shift			18 (4.0%)
Day	290	67.4%	
Evening / Night	54	12.6%	
Split shifts	29	6.7%	
Regular change of shifts	57	13.3%	
On call tasks			56 (12.5%)
Yes	144	36.7%	
No	248	63.3%	
Employment percentage			18 (4.0%)
≤ 50%	166	38.6%	
> 50% < 80%	104	24.2%	
≥ 80%	160	37.2%	

Note. n = number of respondents

Table 3. Mean, standard deviation and Cronbach's α of study variables (n=448)

Variable / Scale (Range of answer options)	***n***	**Mean (*SD*)**	**Cronbach's α (CI: 95%)**	**missing *n* (%) / N/A *n* (%)**
Work engagement (0 - 6)	446	4.6 (1.1)	.93 (.92 - .94)	2 (0.5)
Vigor (0 - 6)	444	4.5 (1.1)	.74 (.68 - .79)	4 (0.9)
Dedication (0 - 6)	446	4.8 (1.1)	.85 (.81 - .88)	2 (0.5)
Absorption (0 - 6)	444	4.4 (1.1)	.88 (.85 - .91)	4 (0.9)
Burnout				
Emotional exhaustion (0 - 6)	445	1.2 (0.9)	.87 (.86 - .90)	3 (0.7)
Depersonalization (0 - 6)	445	0.5 (0.6)	.68 (.60 - .75)	3 (0.7)
Collaboration (1 – 4)	447	3.4 (0.5)	.80 (.76 - .83)	1 (0.2)
Leadership (1 - 4)	419	3.4 (0.6)	.88 (.86 - .90)	3 (0.7) / 26 (5.8)
Sense of community (0 - 100)[2]	447	82.4 (14.6)	.77 (.71 - .83)	1 (0.2)
Staffing (1 - 4)	447	3.0 (0.6)	.69 (.64 - .75)	1 (0.2)
Teamwork (1 - 5)	442	4.1 (0.7)	.83 (.80 - .86)	6 (1.3)
Feedback (0 - 100)[2]	447	48.9 (20.0)	.61 (.53 - .68)	1 (0.2)
Predictability (0 - 100)[2]	448	63.3 (21.3)	.80 (.76 - .83)	0 (0)
Social support (0 - 100)[2]	448	77.2 (16.7)	.81 (.77 - .84)	0 (0)
Overtime (1 - 5)	410	3.2 (1.2)	N/A	38 (8.5)
Experienced aggression verbal (0 - 6)	445	1.7 (1.3)	N/A	3 (0.7)
Work-family conflicts (0 - 4)	447	2.3 (1.0)	.91 (.90 - .93)	1 (0.2)
Work stressors (0 – 4)	413	1.4 (0.6)	.74 (.69 - .78)	35 (7.8)[1]

Note. [1] Missing values include the "not within my field of responsibility" answer option, [2] for scale calculation, items were transformed on a value range from 0 (minimum value) to 100 points (maximum value), CI = confidence interval, *n* = number of respondents, N/A = not applicable, *SD* = standard deviation

Table 4. Rotated factor pattern and Spearman's rank correlation coefficients of the study variables

		Factor loadings job resources	Factor loadings job demands	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Work engagement			1.00													
2	Emotional exhaustion			-.50***	1.00												
3	Collaboration	.81	-.22	.38***	-.39***	1.00											
4	Leadership	.76	-.26	.30***	-.33***	.63***	1.00										
5	Sense of community	.73	-.07	.33***	-.34***	.55***	.44***	1.00									
6	Staffing	.69	-.47	.29***	-.39***	.58***	.60***	.45***	1.00								
7	Teamwork	.78	-.11	.31***	-.31***	.61***	.53***	.54***	.48***	1.00							
8	Feedback	.61	-.04	.37***	-.21**	.36***	.41***	.37***	.40***	.29***	1.00						
9	Predictability	.54	-.34	.26***	-.31***	.52***	.53***	.33***	.57***	.42***	.28***	1.00					
10	Social support	.83	-.15	.40***	-.37***	.64***	.67***	.51***	.56***	.58***	.50***	.47***	1.00				
11	Overtime	-.14	.71	-.17**	.37***	-.23***	-.28***	-.22***	-.40***	-.19***	-.17***	-.27***	-.27***	1.00			
12	Experienced aggression	-.06	.57	-.19***	.30***	-.12	-.10	-.13	-.13	-.11	-.08	-.15	-.09	.15**	1.00		
13	Work-family conflicts	-.27	.68	-.41***	.57***	-.37***	-.37***	-.26***	-.39***	-.30***	-.21***	-.35***	-.35***	.40***	.21***	1.00	
14	Work stressors	-.35	.67	-.30***	.53***	-.40***	-.36***	-.34***	-.49***	-.36***	-.20***	-.36***	-.41***	.40***	.29***	.42***	1.00

Note. *** = *p*-value <.001, ** = *p*-value <.01

Figures

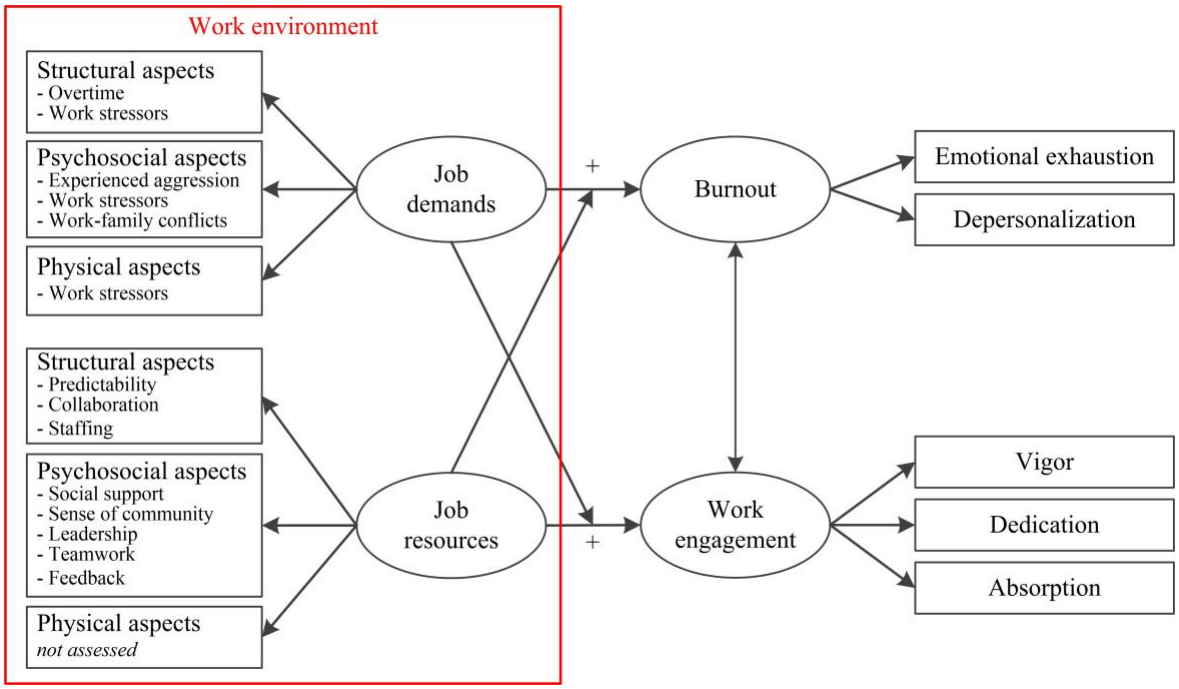

Figure 1. Adapted JD-R model of burnout and work engagement

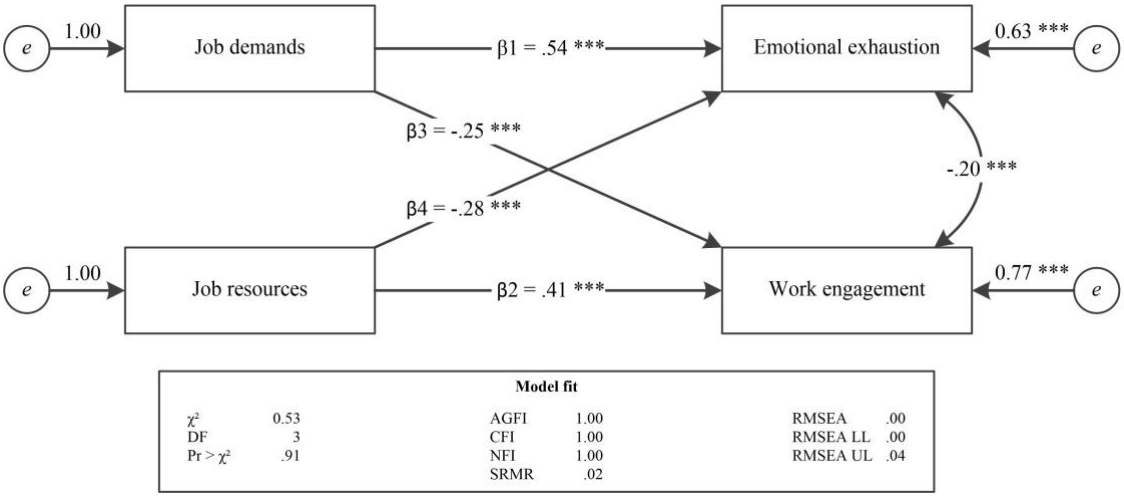

Figure 2. Standardized path solution

Note. *** = *p*-value <.001, AGFI = adjusted Goodness of Fit Index, β = standardized path coefficient, CFI = Bentler Comparative Fit Index, DF = degrees of freedom, *e* = error, LL = lower limit, NFI = Normed Fit Index, Pr = probability, RMESA= Root Mean Square Error of Approximation, SRMR = standardized root mean square residual, UU = upper limit