

THE BALANCE BETWEEN WORK AND HOME: THE RELATIONSHIP BETWEEN WORK AND HOME DEMANDS AND ILL HEALTH OF EMPLOYED FEMALES

Author:Karina Mostert¹**Affiliation:**

¹WorkWell: Research Unit for Economic and Management Sciences, School of Human Resources Sciences, North-West University, Potchefstroom, South Africa

Correspondence to:

Karina Mostert

e-mail:

karina.mostert@nwu.ac.za

Postal address:

North-West University, Potchefstroom, Private Bag X6001 (Internal Box 202), Potchefstroom, 2520, South Africa

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ABSTRACT

The aim of this study was to investigate the relationship between work and home demands, work-home interference (WHI), home-work interference (HWI), and ill health of 500 employed females from various occupations. A structural model was tested with structural equation modelling. The results indicated that work demands (work pressure and work overload) are related to ill health (physical ill health, anxiety, depression) via WHI. On the other hand, home demands (home pressure and home overload) are directly related to HWI and to ill health.

INTRODUCTION

Internationally, many changes have occurred in the women's labour market since the early 1980s. In several countries (e.g. Australia, Canada, the United States of America and Japan) there has been a trend towards the greater involvement of women in the labour force and pronounced changes in the patterns of employment of women over the family life cycle (Japan Institute for Labour Policy and Training, 2004; Sorrentino, 1990; United States Department of Labour Women's Bureau, 1999). In the US, women's labour-force participation rates have continued to increase since the 1940s. White women's participation rose from 53% in 1984 to 58% in 1992 and 59% in 2004. For black women, the participation rates increased from 55% to 59% and then to 62% during the same period (Meyer & Mukerjee, 2007). Due to legislation, such as the Employment Equity Act (Act No. 55 of 1998), the same trends are evident in South Africa (Statistics South Africa, 2005). Between 1995 and 2005, there was a substantial increase in labour force participation. Women benefited more from the increased demand for labour over the period, accounting for 55% of the increase in employment between 1995 and 2005, the bulk of which accrued to African women (Van der Westhuizen, Goga & Oosthuizen, 2007). Women accounted for almost six in ten new labour force members over the period. According to Burger and Woolard (2005), three-fifths of the new labour market entrants over the period 1995 to 2002 were women. The net effect is a feminisation of the South African labour force. In general, many wives and mothers continue to hold their jobs through marriage and child-raising responsibilities (Brusentsev, 2002; JILPT, 2004). In South Africa, it also seems that the possible financial burden posed by young children (under the age of seven years) increases the probability of females entering the labour market (Van der Westhuizen *et al.*, 2007).

Despite the increase of women in the labour market, however, there seems to be no alteration in the outlook of gender-role expectations relating to men and women's roles in society. In households where both partners are employed, the work role is still seen to be men's primary domain, while women are still seen as the primary caretaker of the home and children (Doucet, 2000; Windebank, 2001). As a result, employed women have to juggle the demands of both work and family roles. Therefore, pressure may result from the added responsibilities women are contending with, functioning simultaneously as employees, spouses, mothers and members of extended families. According to Kahn, Wolfe, Quinn, Snoek and Rosenthal (1964), the simultaneous 'launching' of demands from various social systems (such as work and home) upon the individual may cause him/her to experience interference between the two roles or domains – i.e. interference between work and home. Work-home interference is defined as a process in which a worker's functioning (behaviour) in one domain (e.g. home) is influenced by negative load reactions that have built up in the other domain (e.g. work) (Geurts & Demerouti, 2003; Geurts, Kompier, Roxburgh & Houtman, 2003; Geurts, Taris, Kompier, Dikkers, Van Hooff & Kinnunen, 2005; Van Hooff *et al.*, 2005). Prolonged conflict between work and home accompanied by demands in both domains, might generate stress, which can ultimately undermine the woman's sense of well-being (Allen, Herst, Bruck & Sutton, 2000; Eby, Casper, Lockwood, Bordeaux & Brinley, 2005; Frone, 2003).

It is clear from recent research literature that negative work-home interference is a bidirectional construct representing two distinct types of interference, namely work-interfering-with-home (or work-home interference [WHI]) – where negative load reactions developed at work hamper functioning at home) and home-interfering-with-work (or home-work interference [HWI]) – where negative load reactions developed at home hamper functioning at work) (see Frone, Russell & Cooper, 1992a; 1992b; Gutek, Searle & Klepa, 1991; MacEwen & Barling, 1994; Williams & Alliger, 1994). Although strongly correlated with one another, they are conceptually and empirically distinct constructs (Frone *et al.*, 1992a; Geurts *et al.*, 2005; Marais, Mostert, Geurts & Taris, 2009; Peeters, Montgomery, Bakker & Schaufeli, 2005). Nevertheless, few studies have simultaneously examined the relations between both types of work-home interference, in combination with demands from both work and home, and ill health. It is important to examine both types of interference because a relation between one type of interference and employee well-being does not allow one to infer that the other type of conflict is also related to poor health (Frone, Russell & Cooper, 1997).

This study aims to test a model of work and home demands, WHI and HWI, and the relationship with self-reported ill health.

Work demands

The general definition of work demands refers to the degree to which the working environment contains stimuli that require some effort (Jones & Fletcher, 1996) and encapsulates the idea that demands from work have negative consequences if they require additional effort beyond the usual to achieve work goals (Demerouti, Bakker, Nachreiner & Schaufeli, 2001). A number of studies have demonstrated relationships between work characteristics and subjective measures of general health (Van der Heijden, Demerouti, Bakker & the NEXT Study Group, 2008; Warren, Carayon & Hoonakker, 2008). For example, Borg and colleagues (Borg & Kristensen, 2000; Lund & Borg, 1999) focused on the impact of both psychosocial and physical work characteristics on self-rated health and found that repetitive work, high work demands, low social support, high job insecurity and high ergonomic exposures all predicted deterioration of self-rated health over time. Link, Lennon and Dohrenwend (1993) found that individuals in occupations that involved 'direction, control, and planning' were less likely to experience depression. Niedhammer, Goldberg, Leclerc, Bugel and David (1998) found that psychosocial factors at work (including psychological demands, low levels of decision latitude and low levels of support at work) were significant predictors of subsequent depressive symptoms. It is therefore hypothesised that work demands will be directly related to ill health (Hypothesis 1a).

Research suggests that pressure and overload are the most important factors determining WHI (Geurts, Rutte & Peeters, 1999; Montgomery, Peeters, Schaufeli & Van Ouden, 2003). For example, Britt and Dawson (2005) examined the concurrent and longitudinal predictors of work-family conflict among soldiers stationed in Europe. Their results revealed that objective and subjective measures of workload are strong concurrent predictors of work-family conflict. In South African studies, work characteristics account for between 24% and 38% of the variance in WHI (Mostert & Oosthuizen, 2006; Van Aarde & Mostert, 2008). Based on these results, it is hypothesised that work demands will be related to WHI (Hypothesis 1b).

Home demands

Research often fails to consider the role of both work and home demands in relation to ill health. Therefore a more comprehensive picture will be formed by also evaluating home demands. There is little evidence on the potential impact of home characteristics on ill health. Peeters *et al.* (2005) found that both work demands and home demands had a direct effect on burnout, apart from their relationship with WHI and HWI. In the framework of the Job Demand-Resources model (Demerouti *et al.*, 2001), home demands will also require a certain amount of mental and physical effort that is associated with physiological and/or psychological cost. It is therefore plausible to reason that high home demands, like high work demands, will also be related to ill health (Hypothesis 2a).

Research findings consistently support that work is associated with interference originating from the work environment, whereas home characteristics are the major antecedents of interference stemming from the home domain (e.g. Demerouti, Geurts & Kompier, 2004b; Frone *et al.*, 1992a; Geurts *et al.*, 2005). For example, Peeters *et al.* (2005) aimed to make a clear distinction between work and home domains in the explanation of burnout. They found that work demands and home demands have a direct effect on burnout, in addition to the indirect effect through WHI and HWI. Van Aarde and Mostert (2008) also found a moderate but significant relationship between home pressure and HWI. Therefore it is hypothesised that there will be a significant relationship between home demands and HWI (Hypothesis 2b).

Work-home interference

Studies have shown that work and home conditions alone do not account for much variance in overall well-being (e.g. Noor,

1996; 2003), suggesting that there may be other processes at work. One possibility is the intervening role of WHI and HWI. Many studies have viewed WHI and HWI as mediators of relationships between work and family pressures and individual well-being (Janssen, Peeters, De Jonge, Houkes & Tummers, 2004; Koekemoer & Mostert, 2006; Montgomery *et al.*, 2003; Peeters *et al.*, 2005).

Previous studies have shown a direct relationship between WHI and ill health. According to these studies, WHI is not only associated with poor psychological health, including stress (Allen *et al.*, 2000) and mental health (Chandola, Martikainen, Bartley, Lahelma, Marmot & Michikazy, 2004; Emslie, Hunt & Macintyre, 2004; Frone, 2000; Frone *et al.* 1997), but is also associated with poor general ill health, including general well-being (Grant-Vallone & Donaldsson, 2001), self-rated health (Emslie *et al.*, 2004; Higgins, Duxbury & Johnson, 2004) and physical health (Frone *et al.*, 1997; Van Hooff *et al.*, 2005). Based on these research findings, it is hypothesised that WHI will have a significant relationship with ill health (Hypothesis 3).

Home-work interference

A somewhat unsettling aspect in the work-home interference literature is that the majority of studies focus on work-to-home interference, failing to consider the possibility that the home can influence the work environment as well. This trend occurs despite the fact that several studies demonstrated that home-to-work interaction also has important consequences for workers' health and well-being (e.g. Beauregard, 2006; Howard, Donofrio & Boles, 2004; Montgomery *et al.*, 2005; Peeters *et al.*, 2005; Ryan, Kriska, West & Sacco, 2001). For example, in a study investigating the health of postpartum women, Grice, Fedra, McGovern, Alexander, McCaffrey and Ukestad (2007) found that high levels of WHI were associated with significantly lower mental health scores, while medium and high levels of HWI resulted in significantly lower mental health scores. It is therefore expected that HWI will have a significant relationship to ill health (Hypothesis 4).

A structural model of work/home demands, WHI/HWI and ill health

Frone *et al.* (1992a) formulated and tested two models of the antecedents and outcomes of work-family conflict and the interrelationship between work-family conflict and family-work conflict. While one model did not include a direct path between work-family conflict and depression, the other did. They found that the latter model had a better fit than the former. In this model, work-family conflict was found to act as an intervening pathway between work-related variables and individual well-being, while family-work conflict acts as an intervening pathway between family-related variables and individual well-being. They also found that the two forms of conflict were reciprocally related to one another. Several longitudinal studies have tested (parts of) the stressor→WHI→strain model (Demerouti, Bakker & Bulters, 2004a; Frone *et al.*, 1997; Grant-Vallone & Donaldson, 2001; Kelloway, Gottlieb & Barham, 1999; Kinnunen, Geurts & Mauno, 2004; Leiter & Durup, 1996; Peeters *et al.*, 2004; Van Hooff *et al.*, 2005). However, the study of Van der Heijden *et al.* (2008) is the only study that deals with the reciprocal relationships of work demands, WHI and general health. The findings of their study strongly support the idea of cross-lagged reciprocal relationships between work demands, WHI and general health over time. They also found that WHI plays an intervening role in the reciprocal relationship between work demands and health.

Based on these studies, the following model was developed (see Figure 1). The model shows that work demands and home demands influence ill health, either directly or indirectly, via WHI or HWI. The model simultaneously tests the effect of work demands and WHI, and home demands and HWI on ill health. This will ensure a better representation of the complex relationships between the variables that may exist in women's work and family lives.

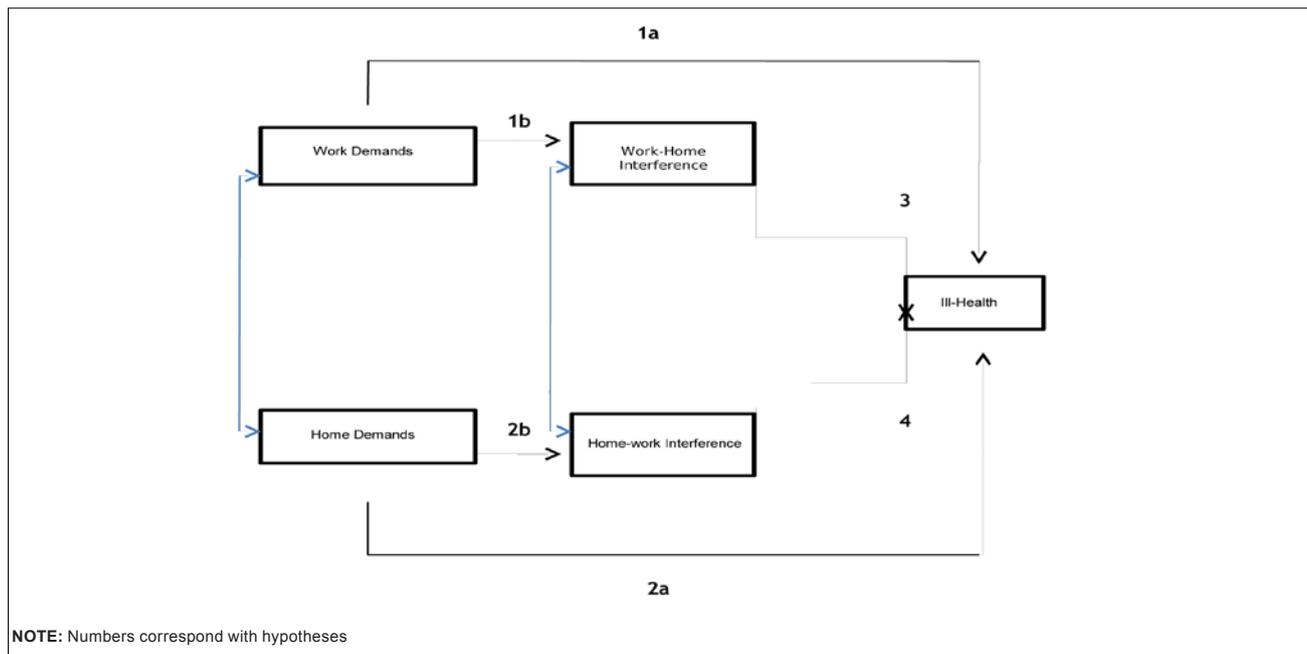


FIGURE 1 Theoretical model

RESEARCH DESIGN

Research approach

This study is quantitative in nature. A cross-sectional survey design was used to reach the research objectives.

Research method

Research procedure

Companies and hospitals in six different provinces (i.e. Free State, Gauteng, KwaZulu-Natal, the North-West Province, Eastern Cape and Western Cape) were approached and female employees were invited to participate in the study. After permission was gained from willing companies and hospitals, name lists with contact details were provided to the researchers. Questionnaires were electronically sent to female employees with email addresses, who were requested to send the electronic version of the questionnaire to two female colleagues/friends who worked at least five hours a day. A return email address was provided. Hard copies of the questionnaires were randomly distributed in the hospitals and to females without email addresses. Two additional hard copies with pre-stamped envelopes were provided, also with the request to send it to two female colleagues/friends. Each questionnaire was accompanied by a letter explaining the rationale of the study and clear instructions on how to complete the questionnaire.

Confidentiality and anonymity were emphasised. In total, 500 usable questionnaires were returned. Participants were also asked to indicate their occupation in the questionnaire.

Characteristics of the participants

For ease of interpretation, participants were classified into five groups, including females in management positions (24%), nurses (27.6%), administrative personnel (18.2%), females who do 'people work' of some kind, e.g. educators, academics, psychologists, teachers, and consultants (25.4%) and a diverse group of female workers, including hairdressers, beauticians, librarians, designers and caterers (4.8%). The majority of participants were married with children (42.8%). Of the total sample, 58.4% had a tertiary education. The majority of the females were White (48.6%) or Black (33.8%) and spoke Afrikaans (41.2%) and African languages (30.8%). With regard to their career phase, most of the participants (41.6%) were in their middle career phase (between the ages of 33 and 45).

Measures

Work demands

Work demands were measured using two scales, namely work pressure (five items, e.g. 'Do you have to work very fast when at work?'; Karasek, 1985) and work overload (four items, e.g. 'Are

TABLE 1 Means (M), standard deviations (SD), Cronbach's alpha (α) and correlations between the model variables

	M	SD	α	1	2	3	4	5	6	7	8
1 Work pressure	2.87	0.63	0.75								
2 Work overload	2.45	0.79	0.82	0.55							
3 Home pressure	2.58	0.82	0.79	0.23	0.22						
4 Home overload	2.26	0.83	0.86	0.15	0.22	0.72					
5 Negative WHI	1.21	0.63	0.86	0.46	0.47	0.31	0.36				
6 Negative HWI	0.58	0.55	0.76	0.16	0.27	0.21	0.22	0.39			
7 Physical ill health	1.95	0.84	0.83	0.11	0.18	0.24	0.23	0.26	0.2		
8 Anxiety	1.89	0.76	0.84	0.19	0.3	0.19	0.23	0.37	0.32	0.48	
9 Depression	1.52	0.7	0.79	0.1	0.2	0.22	0.23	0.3	0.36	0.48	0.56

All correlations ≥ 0.10 are statistically significant; $r \geq 0.13, p < 0.01$; $0.10 \leq r \leq 0.11, p < 0.05$
 All correlations $0.30 \leq r \leq 0.49$ are practically significant (medium effect)
 All correlations ≥ 0.50 are practically significant (large effect)

you asked to do an excessive amount of work when you are at work?'; Jackson & Rothmann, 2005). All items were scaled on a four-point scale, ranging from 1 (never) to 4 (always), with higher scores indicating higher levels on that particular dimension.

Home demands

Items were developed to conceptually mirror the subscales of the work-demands scale, including home pressure (three items, e.g. 'Do you have to work very fast when you have to complete tasks at home?') and home overload (four items, e.g. 'Do you have too much work to do at home?'). All items were scaled on a four-point scale, ranging from 1 (never) to 4 (always), with higher scores indicating higher levels on that particular dimension.

Negative WHI and negative HWI

The 'Survey Work-Home Interaction-Nijmegen' (SWING) (Geurts *et al.*, 2005) was used to measure negative WHI and negative HWI. Negative WHI refers to a negative impact of the work situation on one's functioning at home (eight items, e.g. 'How often does it happen that your work schedule makes it difficult to fulfil domestic obligations?'), while negative HWI refers to a negative impact of the home situation on one's job performance (four items, e.g. 'How often does it happen that you have difficulty concentrating on your work because you are preoccupied with domestic matters?'). The SWING offers a four-response format varying from 0 (never) to 3 (always).

Ill health

Three indicators of ill health were used. Items were adapted from the General Health Questionnaire (GHQ-28; Goldberg & Williams, 1988) to measure physical ill health (three items, e.g. 'Have you recently been having headaches?'), anxiety (three items, e.g. 'Have you recently been feeling nervous or scared for no good reason?') and depressive complaints (three items, e.g. 'Have you recently been feeling that life is entirely hopeless?'). Items were rated on a four-point scale ranging from 1 (better than usual) to 4 (much worse than usual).

Statistical analysis

The statistical analyses were conducted with the SPSS program (SPSS, 2008) and the Amos program (Arbuckle, 2006). Structural equation modelling (SEM) was used to test a structural model of work/home demands, WHI/HWI and ill health. Maximum likelihood estimation methods were used with the covariance matrix of the scales as input for the analysis. The goodness-of-fit of the model was evaluated using absolute and relative indices. The χ^2 goodness-of-fit statistic and the Root Mean Square Error of Approximation (RMSEA) were used as absolute goodness-of-fit indices. Acceptable fit of the model is indicated by non-significant χ^2 values and RMSEA values smaller than or equal to 0.08 (Cudeck & Browne, 1993). The following goodness-of-fit indices were used as adjuncts to the χ^2 statistics: a) χ^2/df ratio; b) the Goodness-of-Fit Index (GFI); c) the Incremental Fit Index (IFI); d) the Tucker-Lewis Index (TLI); and e) the Comparative Fit Index (CFI).

RESULTS

Descriptive statistics

Table 1 shows the means, standard deviations, internal consistencies and correlation coefficients of the scales included in the analyses.

As indicated from the results in Table 1, the Cronbach alpha coefficients of all the measuring instruments were considered acceptable compared to the guideline of $\alpha \geq 0.70$ (Nunnally & Bernstein, 1994). Both work demands were strongly and practically significantly related to negative WHI and statistically significantly related to physical ill health and depression. Work pressure was also statistically significantly related to anxiety, while work overload was practically significantly related to this dimension of ill health. Both home demands showed statistically significant relationships to negative HWI and all three

dimensions of ill health. Both the work-home dimensions had statistically significant relationships to physical ill health and practically significant relationships to anxiety and depression.

Model testing

The structural model was tested for its goodness-of-fit to the covariance matrix of the measured variables. All the latent factors were operationalised by exogenously observed variables. Work and home demands were each assessed by two observed variables, i.e. pressure and overload. The manifest indicators of the latent ill-health factor were physical ill health, anxiety and depression. For each of these dimensions, a latent variable was specified on which the corresponding scales were loaded, separating random measurement error from true score variance. However, for negative WHI and HWI, there was only one indicator (i.e. there was a one-to-one correspondence between the manifested variables and the underlying latent dimensions). An implication of this is that the correlations among these one-indicator latent variables and other latent variables may be biased because no distinction is made between random error variance and true score variance (Little, Cunningham, Shahar & Widaman, 2002). Bagozzi and Heatherton (1994) suggested the following procedure to overcome this problem: Firstly, a one-factor model was fitted for all items belonging to the three scales. Secondly, separate indicators for each scale were formed by selecting items based on their loadings, alternating items with high and low loadings. As a result, two item parcels were created for each dimension (WHI and HWI).

A model including the hypothesised relationships was tested in a path model. Errors were allowed to correlate between work and home demands and between WHI and HWI. Direct relationships were specified between:

- 1) work demands and ill health (H1a);
- 2) work demands and negative WHI (H1b);
- 3) home demands and ill health (H2a);
- 4) home demands and HWI (H2b);
- 5) negative WHI and ill health (H3); and
- 6) HWI and ill health (H4).

The results of the SEM analyses showed that the hypothesised or proposed model fits adequately to the data ($\chi^2 = 114.90$; $\chi^2/df = 3.19$; GFI = 0.96; IFI = 0.96; TLI = 0.94; CFI = 0.96; and RMSEA = 0.07). However, inspection of the regression weights indicated that the coefficients of the path between work demands and ill health was not significant. The model was therefore re-specified with this path deleted ($\chi^2 = 114.99$; $\chi^2/df = 3.11$; GFI = 0.96; IFI = 0.96; TLI = 0.94; CFI = 0.96; and RMSEA = 0.07). All the other paths were highly significant ($p \leq 0.01$). Parameter estimates are shown in Figure 2. Also seen in Figure 2 is that work demands explained 47% of the variance in WHI, while home demands explained a much smaller 6%. Home demands, WHI and HWI explained 31% of the variance in ill health.

As the results in Figure 2 show, all relationships in the model were significant and in the expected direction, except for the path between work demands and ill health. These results support all the hypotheses, except Hypothesis 1a.

DISCUSSION

This study tested a structural model of how work and home demands are related to self-rated ill health of employed women through the process of WHI and HWI. This research provided an extension of previous studies on the stressor \rightarrow WHI \rightarrow strain relationship, by including both work and home demands and both directions of work-home interference.

The results revealed a set of direct and mediated relationships between work and home demands, WHI, HWI and self-reported ill health. All direct paths in the hypothesised structural equation model were significant, except for the path between work demands and ill health. This finding suggests that the direct

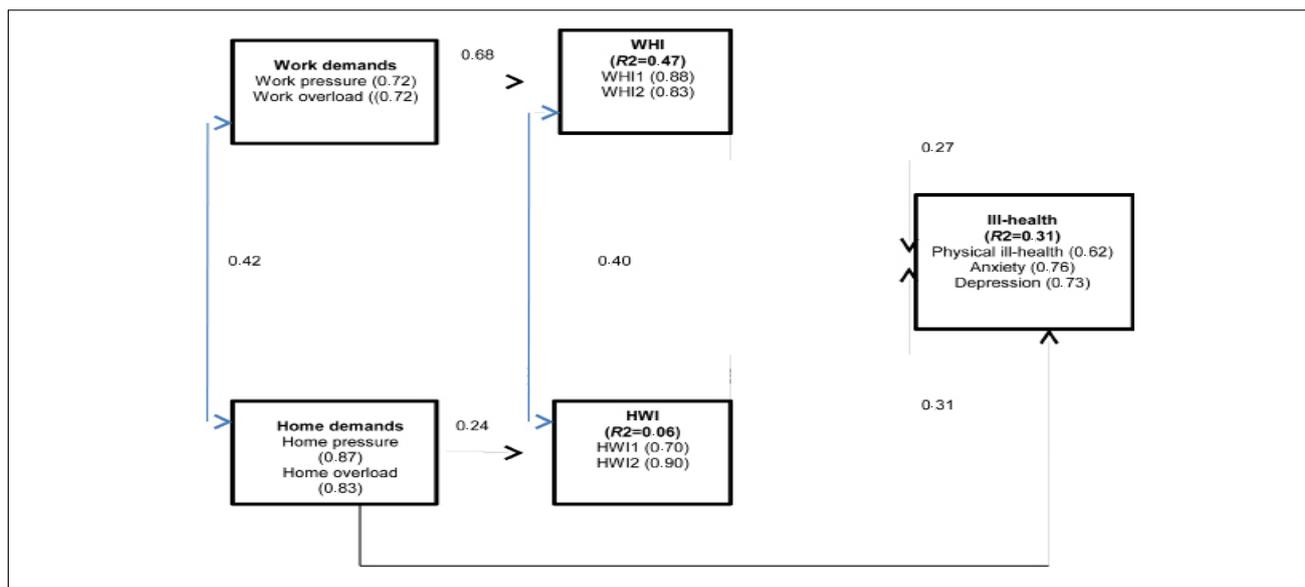


FIGURE 2 Results of the AMOS analyses regarding the proposed relationships between work/home characteristics, WHI/HWI, burnout and ill health

relationship often found between work demands and ill health may possibly be better understood as an indirect relationship in which WHI is a crucial intervening pathway. Work demands may therefore not be directly associated with ill health, but rather exert its negative effects on health through a process of ‘spill-over’ of load effects, most probably accompanied by insufficient quantitative and qualitative recovery during non-working hours (Geurts *et al.*, 2003). This is in contrast with the majority of previous studies (e.g. Link *et al.*, 1993; Niedhammer *et al.*, 1998; Van der Heijden *et al.*, 2008; Warren *et al.*, 2008), although it supports the findings of Geurts *et al.* (2003), who also found no direct relationship between workload and health complaints. The fact that WHI mediated work demands suggests that work overload and work pressure are not contextual in nature, have the ability to influence WHI and are more likely to be brought home. The same is true for home demands, which influence the individual’s experience at work through negative load effects that spill over from the home domain. The mediating effect of WHI is also supported by previous literature, although most of these studies found a partial mediating effect (Janssen *et al.*, 2004; Koekemoer & Mostert, 2006; Montgomery *et al.*, 2003; Peeters *et al.*, 2005).

The partial mediating effect of HWI means that high psychological home demands endanger the balance that employed women should have between work and home. When women are experiencing high work demands, they need recovery time at home to reduce fatigue and other stressful effects of high work demands. However, if they also have high overload and pressure at home, they will possibly experience fewer opportunities to manage home responsibilities and/or have insufficient leisure time to recover from demands faced at work. Therefore, when the time at home is used to deal with additional overload and pressure (instead of using the time to recover from negative load reactions that spilled over to the home domain), women do not fully recover from high effort investment at work (Geurts *et al.*, 2003). As a result, they must then invest compensatory effort to perform adequately when confronted with new work demands. A combination of persisting (high) demands and insufficient recovery may result in the long run in negative load reactions that may become manifest and irreversible (Sluiter, 1999; Sluiter, Frings-Dresen, Van der Beek & Meijman, 2001), and seriously affect health (Sluiter *et al.*, 2001; Van Hooff *et al.*, 2005).

To summarise, previous studies have shown that the interference between work and home is related to psychological ill-being (Grant-Vallonen & Donaldson, 2001). Especially self-rated

health has been shown to be associated with work-to-family conflicts (Emslie *et al.*, 2004; Higgins *et al.*, 2004) and family-to-work conflicts (Higgins *et al.*, 2004). This study confirms these findings, suggesting that work-to-home as well as home-to-work interference, in addition to work and home demands, are related to self-rated health. Given the fact that WHI and HWI mediate the relationship between work and home demands and ill health, it is important to ensure that women are enabled to balance their work and home demands. Women’s health appears to be dependent on their capabilities to fine-tune their professional and private responsibilities. Therefore, their capabilities to cope with often-contradictory needs have strong implications for their levels of physical health, anxiety and depressive mood.

Limitations of the study

Firstly, while the cross-sectional design is well suited to testing the independent effects of work/home demands and WHI/HWI on ill health, longitudinal designs are needed to solve cause-and-effect issues and to disentangle the complex interplay between past experiences and psychological functioning. However, cross-sectional data can provide important initial tests of the causal hypotheses. A second limitation is that all data were collected using questionnaires. This opens up the possibility of response set consistencies. As self-reported measures were used for the predictor variables (work demands, home demands, WHI and HWI) and the outcome variable (ill health), this could potentially lead to inflated correlations due to common method variance, memory effects and similar processes (Podsakoff, MacKenzie, Lee & Podsakoff, 2003). Future research should also use stronger measures of health, such as employee sickness absence, validated scales of somatic complaints, or physiological (hormonal) indicators concerning effort and recovery (e.g. (nor) adrenaline, see Sluiter, 1999).

Recommendations

Most studies concerning the relationship between work demands and strain have focused on quantitative demands (e.g. workload). However, several factors have contributed to the restructuring of work of the last half century (see Cooper, Dewe & O’Driscoll, 2001) with the implication that the nature of work is changing in terms of demands. More jobs are now also including more mental and emotional effort rather than physical effort alone. Future research should assess demands by including a wider variety of quantitative, emotional and mental demands in the work and home domains (see Peeters *et al.*, 2005).

The percentage variance in HWI explained by home demands was relatively small (6%). This indicates that other factors in the home environment should be examined. Such aspects could include family and household obligations, childcare, conflicts with family members, and non-work hassles (Bolger, DeLongis, Kessler & Wethington, 1989). Furthermore, demographic and personality variables should also be examined. This is deemed necessary because the links between work, family and ill health are complex and researchers need to specify multiple underlying pathways or processes by which WHI and HWI may lead to health impairment. This is important because the stress process is not invariant – both personality and environmental factors influence the relationships between stress and outcomes (see Parkes, 1994). Furthermore, personality characteristics may also moderate the effects of health problems on negative organisational outcomes such as turnover intention or sickness absenteeism. Consequently, future research needs to be conducted using personality frameworks such as the Five-Factor Model (Costa & McCrae, 1992) to increase the understanding of personality types that are more susceptible to health-related problems.

Although it seems that work and home influence each other in a negative way, previous research has recognised that it can also be beneficial for workers to combine work and family lives, and that it is equally important to study the positive interaction between work and home (e.g. Hochschild, 1997; Kirchmeyer, 1993). For example, Moen, Dempster-McClain and Williams (1992) found that fulfilling multiple roles, participating in volunteer work on an intermittent basis, and belonging to a club or organisation are positively related to various health measures. Grzywacz and Marks (2000) showed that positive spill-over was related to factors that facilitated development (e.g. decision latitude, family support) and that participation in multiple roles provides a greater number of opportunities and resources to the individual that can be used to promote growth and better functioning in other life domains. Positive WHI has also been linked to work engagement (Montgomery *et al.*, 2003; Mostert, 2006; Mostert, Cronje & Pienaar, 2006). Future studies could improve the current model by including work and home resources and positive WHI/HWI.

From a practical point of view, the findings in this study show that the corporate world should be aware of the relationship between demands from and interference between work and home and the link with ill health. As such, organisations should monitor work demands, while at the same time considering home demands. It is important to provide sufficient resources at work to deal with work demands. For instance, previous research indicated that colleague support at an institutional level is a very important resource when it comes to situations of psychological stress (Kirpal, 2004). In addition, strategies for prevention and/or intervention of WHI could be based upon flexibility of weekly working hours, daily starting and finishing times, provision of flexible, out-of-hours childcare, flexible carer's leave and paid maternity and paternity leave (Bohle, 2002). Workplace flexibility is specifically believed to benefit both workers and the employing organisation. Given strong evidence linking indicators of WHI to ill health (Frone, 2003), flexibility has been viewed as a strategy for promoting employee health and well-being because it aids workers in integrating their work and family lives. Casey and Grzywacz (2008) also provide longitudinal evidence indicating that flexibility is associated with health or well-being over time.

The results of this study also indicated a relationship between home demands, HWI and ill health. Not only is the home side of the equation under-researched, it is also undervalued in terms of how it can affect the work role of individuals. Recently, Demerouti, Taris and Bakker (2007) showed in a longitudinal study that experiences in the home domain influence work performance via HWI and a lack of recovery at home. Their findings suggest that organisations should not only provide

work-related training and support to employees, but also try to provide training and support for non-work-related demands (e.g. parental training, role reorientation for couples, possibilities for working at home, or childcare facilities). Indeed, previous studies have shown that the implementation of family-friendly policies may be beneficial for combining work and family responsibilities (e.g. Demerouti, 2006; Dikkers *et al.*, 2007).

Finally, women themselves must invest in their own health and develop their time management skills. This will enable them to be able to buffer potential negative effects of increasing and enduring demands at work and home and to learn to balance work and family responsibilities. Given the important role of recovery after work (Demerouti *et al.*, 2007; Sluiter *et al.*, 2001; Van Hooff *et al.*, 2005), it is important to consider the extent to which various activities contribute to recovery. Research by Sonnentag (2001) and Zijlstra and Rook (2003) showed that physical activity (e.g. sports, exercise) is most beneficial for recovery, while more passively oriented activities (e.g. watching television) seemed to have the least impact on recovery. Another important factor to consider in the recovery process is sleep. It is well recognised that sleep is an essential component of the recovery processes of mind and brain (Edell-Gustafsson, Kritz & Bogren, 2002; Totterdell, Spelten, Smith, Barton & Folkard, 1995). Women should therefore make sure to get sufficient sleep, in order to function optimally the following day.

AUTHOR'S NOTE

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