Title: The Work-Related Quality of Life (WRQoL) scale for Higher Education Employees

Previous research suggests that higher education (HE) employees experience comparatively high levels of job stress. A range of instruments, both generic and job specific, has been used to measure stressors and strains in this occupational context. The Work-Related Quality of (WRQoL) scale is a measure designed to capture perceptions of the working environment and employees responses to them. This study explores the factor structure of the WRQoL for HE employees. Survey data were collected from workers in four HE institutions in the UK (N = 2136). Confirmatory Factor Analysis (CFA) methods were used to investigate the explanatory power of using a six factor model (Job and Career Satisfaction, General Well-Being, Home-Work Interface, Stress at Work, Control at Work and Working Conditions) to explain the data. A first-order CFA model fitted the data well, whilst a second-order model produced an acceptable fit. Results provide evidence to support the use of the WRQoL psychometric instrument as both a multidimensional and uni-dimensional measure to assess the quality of working life of employees in higher education. The practical utility of the measure to help improve the quality of life of employees working in the HE sector is discussed.

Keywords: Quality of Working Life (QoWL), Higher Education (HE), Confirmatory Factor Analysis (CFA), work-life balance, stress and well-being.

Introduction

The human and financial costs of work-related stress, to business and industry are well documented. A large-scale study by the UK Health and Safety Executive (HSE) indicated that around one employee in every five reported finding their job either "very" or "extremely" stressful (Webster & Buckley, 2008). It has been estimated by the HSE that 105 million working days are lost to job stress each year (accounting for 11 percent of all absences); this is thought to represent a cost to organisations of £8 billion (HSE, 2003). Strong associations have been found between work-related stress and a number of other negative outcomes that are costly to organisations, such as under-performance, early retirement, employee turnover, accidents, and substance abuse (Earnshaw & Cooper, 2001; Jones & Bright, 2001; Worrall & Cooper, 2006). There is, therefore, a clear incentive for organisations to manage work-related stress effectively.

Studies conducted over the last few years in the UK and other countries such as Australia, Canada, the USA, India and China indicates that work-related stress is widespread in HE (Pandey & Tripathi, 2001; Tytherleigh, Webb, Cooper & Ricketts, 2005; Kinman, Jones & Kinman, 2006; Zhang, 2007; Catano, Francis, Haines, Kirpalani, Shannon, Stringer & Lozanski, 2007; Court & Kinman, 2008; Winefield, Boyd, Saebel & Pignata, 2008; Buckholdt & Miller, 2009).

Research at a national level in the UK has highlighted a number of work-related stressors and high levels of strain in the HE sector. Tytherleigh et al. (2005) sampled employees from 14 HE institutions and found that the most significant stressor was job insecurity, followed by poor work relationships, lack of job control and inadequate resources and communication. Two national studies conducted in the UK in 1998 and 2004 reported in Kinman et al. (2006) highlighted perceptions amongst HE employees that demands had accelerated in recent years and that levels of job control and support had declined. Other aspects of work considered to be particularly stressful were rushed pace of work, lack of respect and esteem, too much administrative paperwork, inadequate administrative and technical support, lack of opportunity for promotion and ineffective communication. Work-life balance was found to be generally poor and levels of psychological distress were found to exceed those of many other professional groups and the general population. A more recent study of 9740 employees in the HE sector has found that nearly half respondents indicated that their general level of stress was high or very high, with nearly one third indicating that they often experienced levels of stress they found unacceptable (Court & Kinman, 2008). This study also found that the majority of the HSE management standards for work-related stress, especially those relating to work demands and support, were not met.

The HSE management standards approach is a practical framework by which sectors and individual organisations can establish the extent to which they are managing the well-being of their employees, and how this compares with the UK workforce as a whole (Cousins, Mackay, Clarke, Kelly, Kelly & McKaig, 2004). The broader concept of Quality of Working Life (QoWL) has been developed in an endeavour to provide an overview of the experience of working and explain more fully the way in which various factors interact to affect individuals at work (see: Sirgy, Efraty, Siegel & Lee, 2001; Warr, Cook and Wall, 1979). The assessment of QoWL assists

organisations in the identification of factors that influence employees at work. Staff can be surveyed using a valid and reliable QoWL measurement tool to elicit their experience of a broad range of workplace factors encompassing stressors such as control and demand, as well as outcomes such as psychological well-being, job satisfaction and the work-home interface.

Information gained from assessing employees' QoWL can be utilised by employers to determine what appropriate action might be taken to enhance general QoWL or specific aspects of this. Benefits associated with increased employee QoWL include; reduced sickness absence, turnover, absenteeism, improved retention, productivity, performance, recruitment, morale and commitment (Efraty, Sirgy and Claiborne 1991; Fuller, 2006; Worrall and Cooper, 2006). Nonetheless, the validity and reliability of QoWL measures has so far been limited. A recent examination of the Work-Related Quality of Life (WRQoL) scale for healthcare workers by Van Laar, Edwards & Easton (2007) indicated, however, that this new scale had good psychometric properties. This measure draws upon the work of Loscocco and Roschelle (1991) emphasising the importance of assessing both work and non-work contexts to provide a wider conceptualization of QoWL. The measure comprises a broad range of sub-scales, namely: Job and Career Satisfaction; General Well-Being; Home-Work Interface; Stress at Work; Control at Work; and Working Conditions. The underlying theoretical rationale of the WRQoL scale is based on the notion that many facets of work experience cannot be adequately explained in isolation (e.g. stress and strain only), and need to be considered together. A closer inspection of the potential complex relationships between the six subscales from the WRQoL scale can provide employers with a more in-depth examination of how these factors influence one another.

Although the psychometric properties of the WRQoL measure were tested with a sample of healthcare workers and found to be good, it is argued that the instrument is not context specific and would be relevant to other groups of public sector employees (Van Laar et al., 2007). The authors noted, however, that it is necessary for the measure to be tested psychometrically in other occupational groups in order to cross-validate the item and factor structure. More specifically, Van Laar et al. (2007) suggested that additional research should be conducted to test whether, in addition to the six factors of the multidimensional explanation for WRQoL, a higher order uni-dimensional latent construct might be present within the instrument which could provide a single overall index of QoWL. Multidimensional and uni-dimensional models can be tested using first-order and second-order CFA statistical techniques respectively.

Evidence has been presented above that HE may be a particularly stressful working environment. Although several studies have been conducted in the UK, several measurement instruments has been utilised to assess diverse aspects of what might be considered QoWL such as job satisfaction, well-being, home-work interface, control and support at work, psychological distress and perceptions of work-related stress. It is argued that the WRQoL scale has particular utility to help organisations diagnose the well-being of employees. By using a more compact and self-contained measurement instrument to explore employees' attitudes towards and responses to their working environment, whilst still preserving the breadth of the WRQoL construct, this will reduce completion time, contain less missing responses and thus

maximise response rates (Stanton, Sinar, Balzar, & Smith, 2002). Findings have the potential to help organisations to more precisely pin-point where changes should be targeted and where examples of best practice might be found. For example, if the findings from a survey that utilises the WRQoL scale indicate that employees are experiencing high levels of stress, HE institutions may opt to introduce corporate stress management interventions to help make staff more resilient to stress. Moreover, information from the other five factors that comprise the WRQoL scale will provide more specific evidence as to the nature of the stress involved and where more in depth interventions might be best targeted. For example, if higher Stress at Work levels is associated with poorer Home-Work Interface scores then organisations might usefully look at introducing work-life balance policies such as flexible working hours, child care facilities and/or job rotation etc., to help ameliorate such effects.

Use of the WRQoL scale would also be consistent with institutional and national health and safety policies such as the UK's Health & Safety Executive (HSE) legislation. Employers have a legal duty of care for the health and safety of their employees and a duty to assess levels of workplace psychosocial hazards such as work-related stress and well-being (Edwards et al, 2008). The use of validated instruments such as the WRQoL scale will provide objective evidence that these issues are being properly addressed within organisations.

It is argued that the WRQoL instrument has considerable potential to help guide interventions within HE institutions, but it is necessary to validate the instrument within this working environment. This study addresses the recommendations by Van Laar et al. (2007) by exploring the psychometric properties of the WRQoL scale using data from the HE sector. A scale with good psychometric properties will be useful to HE institutions throughout the UK to evaluate employees' Quality of Working Life. This study will also further examine the theoretical argument regarding the conceptualisation of the WRQoL scale and the underlying concept of QoWL by comparing both multidimensional and uni-dimensional levels of measurement

The current study's three main aims are:

1. To conduct a first-order CFA to test the multidimensional factor structure of the WRQoL scale.
2. To conduct a second-order CFA to test the uni-dimensional factor structure of the WRQoL scale.
3. To conduct a chi-square difference test between the first-order CFA and the second-order CFA to determine which WRQoL model provides the best results.

Methodology

Participants

Seven thousand five hundred and thirty employees from four UK universities (three pre -1992, one post -1992) were asked to participate in the current study as part of a national Quality of Working Life survey. Data collected from the four universities were merged to create one large WRQoL dataset reflecting the general UK university working population.

Two-thousand five hundred and eighty two responses were received from participants, giving a response rate of 34%. However, 17% of those responses were

not appropriate for factor analytical techniques as they had at least one missing value and were removed from the dataset. The remaining dataset with missing values removed contained 2136 cases (28% of all employees).

Sixty four per cent of university employees who responded to the survey were female and 50% of staff were aged between 25 and 40 years. Employees, on average, had been continuously working at their current HE institution between six to 10 years, 79% had permanent work contracts and 9% of the sample considered they belonged to an ethnic minority group. Seventy nine percent of respondents worked full-time with only 4% classified as having a disability.

Measures

The 23 item WRQoL scale developed by Van Laar et al. (2007) was used in the current study to measure six factors (JCS, GWB HWI, SAW, CAW and WCS). The WRQoL scale has been designed so that the questions can be used in any occupational setting. All responses across all six sub-scales were recorded on a five-point Likert scale (*1 = Strongly Agree through to Strongly Disagree = 5*).

Procedure

The 23 item WRQoL scale was completed online by university staff from the four institutions. Requests to complete the questionnaire were distributed via the internal email system at the universities. Confidentiality of participant responses and the right to withdraw from the survey were outlined via instructions to employees.

Evaluation of WRQoL sub-scale reliability

The following analysis was performed to explore the current instrument's scale reliability. Measures with good reliability are indicative of an instrument that truly measures what it is believed to measure. The internal reliability (correlation between questions) of the six subscales from the WRQoL scale was estimated using Cronbach's alpha. A greater alpha value represents greater reliability for the scale. The overall Cronbach's alpha value, which is related in part to the total number items in the scale, for the whole 23 item scale was .94 which is excellent. The Alpha sub-scale reliabilities for each of the six WRQoL sub-scales follow below.

Job and Career Satisfaction (JCS). The first sub-scale measures aspects of job and career satisfaction and contains six items. An example of an item is: *"I am satisfied with the career opportunities available for me at the organisation"*. Cronbach's alpha sub-scale reliability for the current study was .85 for this sub-scale. This is similar to previous levels of reliability found for this sub-scale by Van Laar et al., 2007 (.86).

General Well-Being (GWB). The second sub-scale represents everyday happiness and satisfaction and again contains six items and is labelled GWB. A sample item from the scale is: *"Generally things work out well for me"*. Scale reliability from the current study produced an alpha value of .90. Van Laar et al. (2007) produced a reliability alpha of .82 for this sub-scale.

Home-Work Interface (HWI). The three questions that reflect the third sub-scale are associated with accommodating family and work commitments and are labelled HWI, also referred to in the literature as work-life balance. An example of a question from this three item sub-scale is: *"My current working hours / patterns suit my personal*

circumstances". Cronbach's alpha for this sub-scale is .78, and for Van Laar et al. (2007) it was .82.

Stress at Work (SAW). The fourth sub-scale represented by two items measures demands in the workplace and has been labelled SAW. An example of one of the items is: *"I often feel under pressure at work"*. Reliability analysis from the current data exhibited an alpha value of .81, which is the same value that was produced by Van Laar et al. (2007).

Control at Work (CAW). The fifth sub-scale measures the level of control an employee feels he or she has over decisions at work and is labelled CAW. This sub-scale has three items and an example of one of the questions is: *"I am involved in decisions that affect me in my own area of work"*. The current study produced a reliability alpha of .72 for this sub-scale, whereas Van Laar et al. (2007) produced an alpha of .81.

Working Condition (WCS). The final sub-scale from the WRQoL scale measures WCS in which questions represent the physical working environment (e.g. *"The working conditions are satisfactory"*). This three item sub-scale produced a reliability alpha of .79. Results from Van Laar et al. (2007) produced a reliability alpha of .75

The reliability alphas above indicate that the six WRQoL scales all have good internal consistency.

Analysis

Following data cleaning and evaluation of the reliability of the six subscales, a first order Confirmatory Factor Analysis (CFA) was conducted to examine whether the same multidimensional six factors which appeared in the Van Laar et al., (2007) sample of healthcare workers was also found in the present sample of higher education workers. Confirmatory factor analysis statistical techniques were specifically used in the current study to explore the items that load on each of the six sub-scales from the 23-item WRQoL measure. A second order CFA was then undertaken to examine whether the six sub-scales could be explained by a single uni-dimensional overarching factor.

Findings from the data

First-Order Confirmatory Factor Analysis

The existence of the above six factor structure in the university pooled data was examined using CFA. In order to test model fit to the data and directly compare results to Van Laar et al's. (2007) CFA, the Comparative Fit Index (CFI), Goodness of Fit Index (GFI), Normed Fit Index (NFI) and Root Mean Square Error of Approximation (RMSEA) were calculated as recommended by Tabachnik and Fidell (2001). Greater values for the CFI, GFI and NFI represent better fitting models. However, lower values for the RMSEA are reflective of better fitting models.

Support was found for a good fitting WRQoL first-order multidimensional sub-scale structure. Goodness-of-fit statistics provided a good fit to the data for the model (CFI = 0.93, GFI = 0.92, NFI = .93 and RMSEA = 0.06). Figure 1 shows that overall this model has strong factor loadings (single headed arrows) and correlations (double headed arrows) across all six WRQoL sub-scales. Goodness-of-fit statistics, high

correlations and strong factor loadings were found to be similar to the findings produced by Van Laar et al. (2007).

INSERT FIGURE 1 ABOUT HERE

Second-Order Confirmatory Factor Analysis

It is possible that WRQoL is more easily conceptualised as a one-dimensional measure rather than a multidimensional model (i.e. many sub-scales). To test this, analysis was conducted to explain if the six first-order factors (JCS, GWB, HWI, SAW, CAW and WCS) come together to produce an overall, second-order factor model (general WRQoL). The analysis found that Chi-square was statistically significant at 2596.28 (225, $n = 2136$), $p < 0.01$. Goodness-of-fit statistics produced an acceptable to good fit to the data (CFI = 0.91, GFI = 0.89, NFI = .90 and RMSEA = 0.07). The resulting model showed strong factor weights (except SAW) on the overall second-order WRQoL factor (see Figure 2).

INSERT FIGURE 2 ABOUT HERE

First and Second-Order Model Comparison Analysis

A Chi-square difference test conducted between the first-order (multidimensional) and second-order (uni-dimensional) models found that the first-order model was significantly better fitting (χ^2 (9) = 552.54, p < 0.01), which is confirmed by the better chi-square value and goodness-of-fit statistics.

INSERT TABLE 1 ABOUT HERE

Assessment of the WRQoL scale

This research tested the Work-Related Quality of Life (WRQoL) scale and its component sub-scales, using both first and second-order CFA statistical techniques. The first-order multidimensional CFA produced a good fitting model, whilst the second-order uni-dimensional CFA produced an acceptable-to-good fitting model. Model comparison analysis showed that the first-order model was best of the two models, and compared well with findings produced by Van Laar et al. (2007). The current analysis also complied with the recommended Health & Safety Executive (HSE) psychometric assessment check list to test for scale reliability and analytic factor structure (Rick et al., 2001).

Results from both the current study and that of Van Laar et al. (2007) for the WRQoL scale CFA show generally strong correlations across all of the six sub-scales for the first-order models within both studies. These findings further support the argument that the WRQoL scale is a multidimensional construct, where individual sub-scales within the model are highly correlated.

Assessment of WRQoL subscales

Calculation of Cronbach's alpha sub-scale reliability for the six WRQoL factors indicated good levels of reliability for the six subscales. The relationship between the Stress at Work (SAW) sub-scale and the other five WRQoL sub-scales consistently produced the weakest correlations (double-headed arrows in Figure 1) for both the current study and that of Van Laar et al. (2007), with the lowest correlations between SAW and CAW (0.27 and 0.13 respectively). Stress at Work (SAW) also produced the weakest regression weight (single headed arrows in Figure 2) of the six WRQoL sub-scales in the second-order model in the current study (0.50). This may indicate that the SAW sub-scale may need further development and/or that the relationship between SAW and the other sub-scales is more complex and warrants further exploration. For example, the relationships between SAW and other sub-scales affecting overall quality of working life have been shown to be complex, with poor

job satisfaction being linked to both high levels (Richardsen and Burke, 1991; Sullivan and Bhagat, 1992) as well as low levels of occupational stress (Kass et al., 2001).

As suggested in Van Laar et al. (2007), it would be useful to explore the correlations between sub-scales and items from the WRQoL scale (in particular SAW) and the HSE Management Standards Indicator Tool measuring work-related stress (see Edwards, Webster, Van Laar and Easton, 2008). Such research may allow refinement of the SAW sub-scale or reinforce the need to review conceptualisation of the relationship between work-related stress and QoWL.

Closer inspection of the second-order WRQoL scale CFA also shows that, whilst the SAW scale does not produce a very high regression weight on the higher order WRQoL latent sub-scale, the other five sub-scales do (see Figure 2). This finding can be seen as providing evidence to support the theoretical argument that the WRQoL scale is also a uni-dimensional construct that contains a higher-order overall single measure of WRQoL. Further evidence in support of such a proposition can be found in the reliability analysis performed for the overall 23 item scale, which produced a Cronbach's alpha of 0.94. This value indicates that the 23 items are all substantially measuring the same underlying concept, and indicates that the scale could appropriately be used with both individuals and with other employee groups (De Vellis, 2003).

Implications for use of the WRQoL scale

Validity of the WRQoL scale appears to be strong for higher education employees in the UK. As more Universities use the scale it will become increasingly valid to compare findings across departments, working groups and even make comparisons at the institutional and sector level (i.e. old and new universities).

As preliminary support has been provided for the validity of the WRQoL scale in HE institutions in the UK, studies might further examine its suitability within other countries. Indeed, the WRQoL scale has been translated into four languages or dialects and is currently being used across a wide range of international higher education settings by researchers from 17 separate countries (reference needed?). Longitudinal studies will provide an insight into the manner in which the WRQoL scale reflects changes in organisational outcome measures over time such as work performance, turnover and absenteeism. This would be of direct practical relevance to employers who might wish to use such a measure to evaluate endeavours to improve employees' QoWL and better understand links with institutional performance indicators.

The present research builds on the work conducted by Kinman and Jones (2004) and Tytherleigh (2005) who examined stress and well-being in UK university employees. It can be argued that the WRQoL measure offers a more efficient way of assessing QoWL, as it appears to encompass the main factors addressed in the battery of instruments previously used by researchers.

Overall, it is suggested that HE institutions focus on the following issues:

- Evaluate employee well-being using the psychometrically robust WRQoL scale which allows a broad range of work-related measures to be evaluated (Job and Career Satisfaction, General Well-Being, Home-Work Interface, Stress at Work, Control at Work and Working Conditions).
- Introduce organisational development intervention programmes based on the diagnosis provided by WRQoL scale results.

- Periodically conduct follow-up studies to re-evaluate the quality of working life of employees based on interventions introduced within the organisation to examine if the programme(s) have had a measureable impact.

Based on the findings of this study, it is argued that the utilisation of the WRQoL instrument within HE institutions is the first step in diagnosing and consequently improving employees' work well-being and job performance. This in turn has the potential to enhance the delivery of education to students and improve working relationships amongst work colleagues. Enhanced QoWL should also create a more capable and productive workforce for all stakeholders (organisation, employee and student).

Final conclusions

Finally, the current research contributes to the literature by providing evidence in support of the validity of a six sub-scale 23 item instrument that measures Quality of Working Life. This positive evaluation indicates that the WRQoL scale can be used by organisations as both a multidimensional and uni-dimensional measure. That is, the six individual WRQoL sub-scales can be used, or taken together as a single overall measure of QoWL. The current research specifically indicates that the scale can be used by employers within the higher education sector as a key performance indicator (KPI) to assess the well-being of university employees. The WRQoL scale is brief, and so provides organisations with a convenient measure that is simple, quick and easy to implement.

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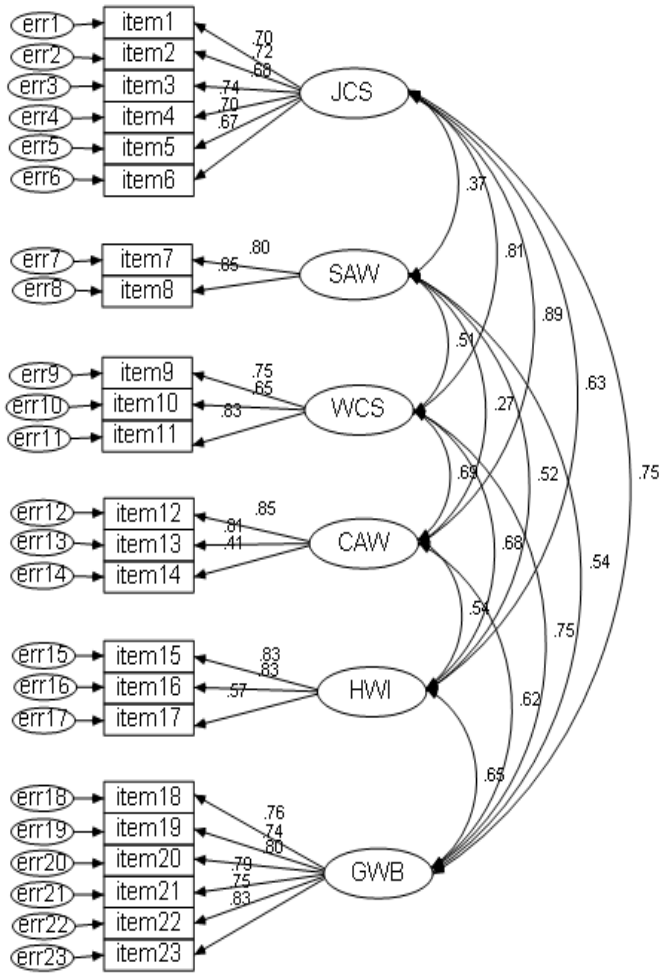
Table 1: Goodness-of-Fit Statistics and Model Comparison Analysis for the First-Order and Second-Order WRQoL Scale Confirmatory Factor Analysis

Model	$\chi 2$	d.f.	CFI	GFI	NFI	RMSEA
First-Order Model	2130.57	216	0.93	0.92	0.92	0.06
Second Order Model	2683.11	225	0.91	0.89	0.90	0.07
Model Comparisons	$\chi 2$ Diff		d.f.		P Value	
First-Order vs. Second-Order Model	552.54		9		sig*	

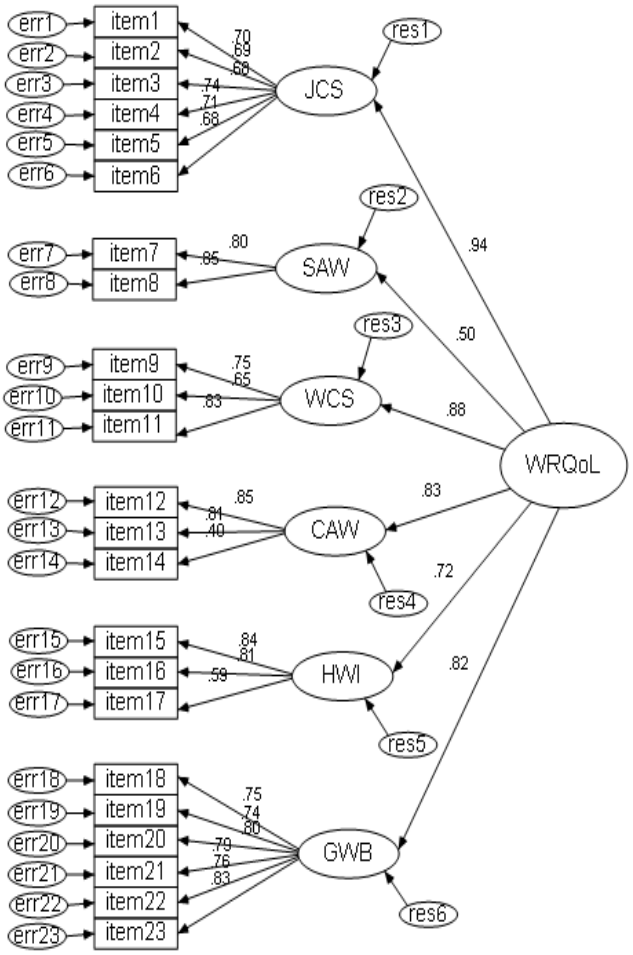
$p < .001$*

Figure 1: The Work-Related Quality of Life Scale First-Order Confirmatory Factor Analysis



Note: JCS = Job and Career Satisfaction, SAW = Stress at Work, WCS = Working Conditions, CAW = Control at Work, HWI = Home-Work Interface and GWB = General Well-Being.

Figure 2: The Work-Related Quality of Life Scale Second-Order Confirmatory Factor Analysis



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