



# Predictors of “quality of work” and “poor health” among primary health-care personnel in Catalonia

Health-care  
personnel in  
Catalonia

203

Evidence based on cross-sectional,  
retrospective and longitudinal design

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Simon L. Dolan

*Institute for Labor Studies, ESADE Business School, Ramon Llull University,  
Barcelona, Spain*

Salvador García

*Faculty of Social Psychology, University of Barcelona, Barcelona, Spain*

Carmen Cabezas

*Fundació Jordi Gol i Gurina for the Promotion of Primary Care Research,  
Barcelona, Spain, and*

Shay S. Tzafrir

*Faculty of Social Welfare and Health Sciences, University of Haifa, Haifa, Israel*

## Abstract

**Purpose** – The purpose of this paper is to test a theoretically driven model of the relationship between job demands, employees’ motivation and resources, and supervisory support on employees’ quality of work lives and their general health.

**Design/methodology/approach** – The study uses large survey data that were collected in the years 1995, 2002, and 2003 respectively, drawn from the public health care employees sector in Catalonia (Spain). Albeit cross-sectional methodology, the study embraces an additional retrospective and longitudinal design.

**Findings** – The 2002 cross-sectional study ( $n = 2,926$ ) supports the assertion made by stress researchers regarding the extent to which both job demands and lack of supervisory support predict low QWL and negative health outcomes: perceived motivation, resources and capabilities also appear as determinants but to a lesser extent. The stability of the results obtained was tested retrospectively by cross-legging the model for the 1995 survey ( $n = 2,901$ ). In addition, a follow-up study (i.e. longitudinal) was conducted in 2003 ( $n = 10,003$ ) to see whether the model still holds. By and large, the three-level design shows the stability of the prediction in the same direction.

**Practical implications** – The paper discusses some possible prevention strategies to reduce the low QWL and negative health outcomes within the Public Health Sector.

**Originality/value** – The paper covers all categories of personnel in the health care personnel and thus external validity is very strong. Findings permit the taking of concrete actions to reduce stress, reduce negative health outcomes and by and large enhance the quality of work lives of the people in this sector.

**Keywords** Stress, Job satisfaction, Personal health, Public sector organizations

**Paper type** Research paper



## Introduction

Concern for the quality of working life (hereafter QWL) preoccupied social scientists for the past several decades. QWL is a major issue for employees, and how organizations deal with this issue is of both academic and practical significance. Therefore, it is no wonder that thousands of studies revolved around the concept of job satisfaction, and stress as the core concepts of it. QWL and its relationships with employee health and performance became an explicit objective for many of the human resource policies in modern organizations (Dolan *et al.*, 2007a, b). As organizations are struggling to survive and become more efficient, an accrued interest has evolved around the concept of professionals working life. An increasing body of evidence links what could be termed management related conditions of work with psychological stress and negative QWL and more specifically health outcomes.

Management-related conditions of work that are linked with negative health include lack of control, autonomy, influence, participation or decision latitude (Dyer and Quine, 1998; Glass and McKnight, 1996), lack of supervisor support (Dolan *et al.*, 1992), lack of perceived organizational and general support (Eisenberger *et al.*, 2004; Rhoades and Eisenberger, 2002), and subjective underemployment as well as lack of skill utilization. Nonetheless, among the reasons for the different findings pertaining to the understanding of the QWL phenomena, scholars argue that the latter can be viewed from a contrasting societal perspectives (Burrell and Morgan, 1979), reinforced by qualitative research and the ambiguous and thus multi-interpretable definitions of QWL. Others point out to the lack of an external framework supported by validated research instruments (Parker, 2003). As a result, the generic logic for studying the quality of work has become popular among managers, organizational consultants and social writers, but the vast majority of the latter were conducted in the private sector. Scientific studies that have examined the Quality of working lives of professionals working in the public sector are less frequent and of those the one reported on the psychometric properties i.e. (construct validity) of the dimensions of QWL and its relationships with health and well being are very scant. The consistency of these findings across different outcomes invites speculation as to whether support from supervisor might also affect QWL as well as NHC (hereafter NHC) at the health care industry.

In addition, at this stage, there is little consistency in the literature about the differences and similarities of organizations from the public and the private sectors about HRM systems (Harel and Tzafir, 2002). Rousseau and Fried (2001) for example, concluded that organizations should not be examined out of the context in which they work. The issue of contextualization in organizational research, noted by the authors offered to address context in a way that enhances the understanding of organizational behavior and the validity of research. Therefore, the primary purpose of this study was to further our understanding of the relationships between job demands and management practices in the public health sector and the impact on its professionals health. Specifically, the objective was to determine the degree of direct and indirect influences of employee job demands, feeling of autonomy and control in interaction with perceived resources and the relative impact of the latter on health outcomes.

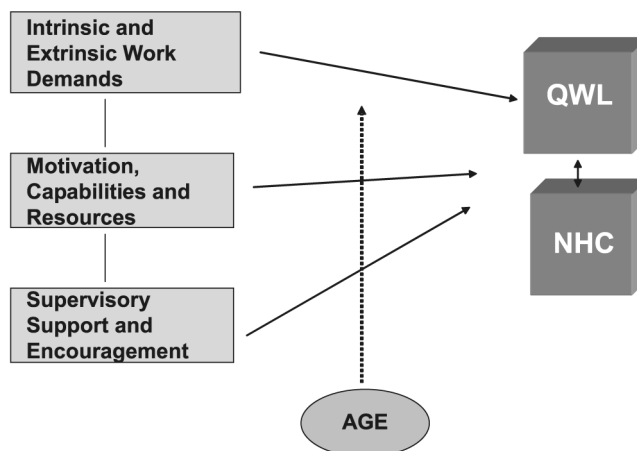
The present study aims at examining a conceptual model pertaining to the professional quality of life in a population of primary care health personnel working in the public sector in Catalonia and to test its corresponding psychometric qualities (i.e.

internal consistency, underlying structure) as well as its discriminative capacity in predicting overall QWL and health outcomes.

### Theory and hypotheses

One of the most frequent stress models and theoretical frameworks that are discussed in the literature is the Karasek and colleagues model (i.e. Karasek, 1989, 1990). The model response to stress-related physical illnesses issues, emphasize the importance of work environment. The Karaseks' model assumes that the combination of high job demands along with low job control precipitates psychological and physical strain. By contrast, jobs in which both demands and control are high leads to well being, learning and personal growth, especially among professional workers. Investigating the role of job content, Pelfrene *et al.* (2003) acknowledged that both perception of job insecurity and the perceptions of impact of world market competition correlate positive with poor health indicators. Also, Jamison *et al.*'s (2004) study on factors in the work environment, from a 1998 telephone survey, found that occupational status, organizational disruption, and organizational discordance associate with ill health. While this study was only inspired by the theoretical perspective of Karasek linking stress and health, due to the complexity as well as the mix results reported in the literature for the multiple linkages between the job demands-control variables (i.e. Karasek, 1979; Johnson and Hall, 1988), a decision was made to simplify and add some variable (i.e. motivation) to the model in view of testing the direct relationship between supervisory support, intrinsic and extrinsic work demands, and employee motivation as the core independent variables with quality of work life and negative health consequences as the criteria. The health care industry was selected as a foci because using a single sector helps to eliminate the potential problem of the interaction between high versus low job demands as mentioned by Schaubroeck and Fink (1998). The relationships among these elements of employment relationships are depicted in Figure 1.

Quality of work provides employees with the motivation (through positive emotion toward their employer) and the opportunity (health environment) to perform well. Karasek's (1979) job demands-control model predicted physiological strain using the



**Figure 1.**  
The working model

joint effects of the demands of a work situation and the discretion available to the workers. Some researchers have included supervisor support as an important component affecting QWL. For example, Boumans *et al.* (2004) mentioned the importance of social support from the supervisor. In a logistic analysis of 42 Texas dialysis facilities, Wai Chai Tai and Robinson (1998) found the impact of less supervisor support on turnover (Gellis and Chun Kim, 2004). Moore and Mellor (2003) studying 201 hospital nurses found that support from supervisors as well as other intrinsic and extrinsic support contribute positively to nurses' health and reduce the level of avoidance strategies. According to Michie and Williams (2003) poor social support as well as long hours work, work overload and other extrinsic factors, are associated with psychological ill health.

Schaubroeck and Fink (1998) mentioned the importance of demands  $\times$  control  $\times$  support interaction for predicting health symptoms. For that reason the research reported herein also takes into account the motivational part as well as the intrinsic and extrinsic job demands components. Lewis *et al.* (2001) found support for the importance role of extrinsic (such as: salary and benefits) and intrinsic (such as: skill discretion) factors in determining QWL. In addition, pressure demands via role ambiguity and future uncertainty were found to cause significance increased in systolic blood pressure (Pollard, 2001). Godwy (1988) in a research within human service administration concluded that in order to improve QWL the use of strategies which enhance employee motivation are important.

Deriving from these findings, the following hypothesis is proposed:

- H1.* Supervisor support, intrinsic and extrinsic job demands, as well as motivation correlate significantly with (a) overall quality of working life and (b) negative health consequences, for professional's health care employees operating in the Catalan Public Health System

This study represents one angle of a larger study that is conducted periodically and aims at testing the psychometric properties (construct validity and stability) of a Quality of Professional Life Questionnaire (hereafter QPL) among health care personnel in the public sector and also gain insight about the evolution of employees general perception of health and well being in this sector. Therefore another aim of this study is to explore what are the underlying structure and the dimensions of a QPL Instrument and its respective psychometric properties (i.e. issues of construct validity and stability).

## Methods and procedures

### *Sample*

The data used to test the principal hypothesis were obtained from three sources:

- (1) The cross-sectional part of the study was based on responses to a Likert type questionnaire conducted in 2002 for a random sample of primary care centers employees in the Catalan Health Organization. A total of 2,926 people of the 4,504 solicited, answered to yield a response rate of 64.96 per cent
- (2) The retrospective sample for the same institution was conducted in 1995, and 2,901 employees responded.
- (3) The longitudinal portion of the study was conducted in 2003.

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The latter was the most ambitious survey and 15,674 employees were contacted of which 10,003 responded (response rate of 63.8 per cent). In this particular paper we have chosen to concentrate on the cross sectional analysis based on data gathered in 2002, while further support to the validity of the model will be done by cross validating the multivariate analysis with the 1995 data (retrospective) and the 2003 sample (prospective). Test retest measure was also applied to the 2002 sample in order to verify the stability of the measures employed.

### *Measurement*

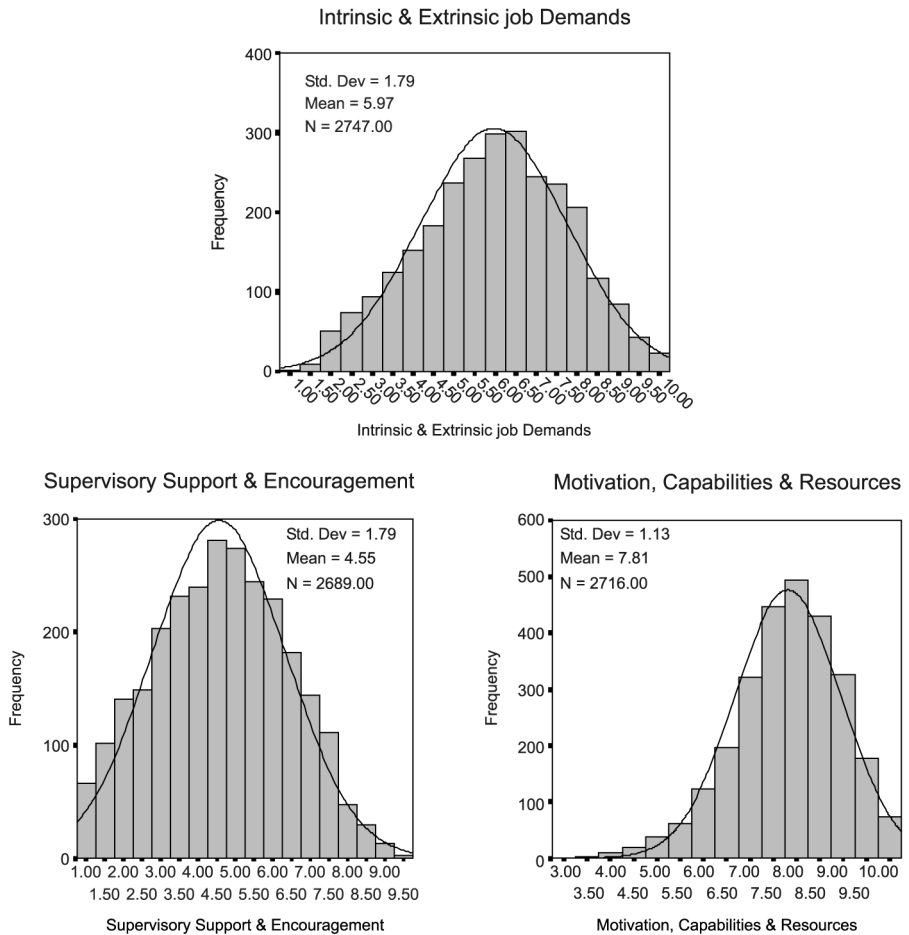
*Independent and control variables.* The Job Content Questionnaire (JCQ) of Karasek and colleagues was designed to measure the “content” of a respondent’s work task(s) in a general manner that is applicable to all jobs and jobholders in the USA. The scales reported by Karasek have been used to predict job related stress and coronary heart disease in the USA and Sweden; the best known scales are used to measure the high demand/low control model of job strain development, however over twenty other aspects of work and the individual are assessed. The scales have also been used for studies of worker motivation, job satisfaction, absenteeism and labor turnover. The principal instrument was developed by Garcia (1990) which in itself is shorten and modified version of Karasek questionnaire and tested in Catalan. It comprised only 33 items measured along Likert type scale (range from 1 to 10) and aimed at studying primarily three concepts pertaining to capture the essence of the dimensions constituting professional quality of life in the health care sector:

- (1) We measured intrinsic and extrinsic work demands, with six items. Three items assessed intrinsic demands for example, my work is characterizes by “fast pace and exhaustion due to lack of time”. The other three items assessed extrinsic demands such as: what is the amount of “pressure for completing the quantity of work”. The reliability of this six item scale was ( $\alpha = 0.82$ ). Wherever necessary, scores were recoded so that by and large high scores reflected high demands.
- (2) Motivation, capabilities and resources were assessed with five items, namely “I have the necessary competences to do my job”, and “My job is important for the lives of others”. The reliability of this six item scale was ( $\alpha = 0.75$ ).
- (3) Supervisory support and encouragement measured perceived employment support from the supervisor and management in general and was assessed by seven items. An example of the item are “recognition of my effort” and “very probable that my suggestions will be heard and applied”. The reliability of this six item scale was ( $\alpha = 0.86$ ).

This questionnaire had been in use as part of the Catalan Health Administration survey since the early 1990s. In this study we will be using principally the 1995, 2002 and 2003 samples and the bulk of the cross sectional analysis will apply only to the 2002 sample. The 33 items questionnaire yielded three underlying factors paralleled to the dimensions above (i.e. Principal components FA varimax rotation). Consequently three scales were constructed. All scales with multiple items showed high degree of internal reliability coefficients (see above) and relatively high degree of stability over time; the test-retest study was done only with a limited sub-sample of 25 participants of the 2002 survey over a period of 15 days. Intraclass correlation coefficients showed a

mean of 0.69, which is quite satisfactory Figure 2 displays the means and the distribution of these three independent factors (for the 2002 sample).

Models of stress and health consider various moderators as a control variable. One of the moderators most frequently used (in addition to personality profiles) is age. A recent British survey found that the highest proportion of cases reported for physicians and psychiatrists, occurred in the age groups of over 45 years (SWI01/02); rates of work-related illness were also found to be generally higher in older (age 45 + ) people of working age. The difference is less marked (but still present) if sufferers among the economically inactive are excluded. These higher rates are explained by the automatic tendency for the prevalence rates for persistent conditions to be greater for older people of working age, and the fact that the prevalence of conditions due to cumulative exposure to hazards will also tend to increase with age. For all that reasons, the only control variable used in this study was age. Age has been divided to five categories: less than 25 years, 26 to 34, 35 to 44, 45 to 54, and over 55 years Information was



**Figure 2.** Mean, standard deviation and general distribution of the three independent variables

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ascertained directly from the questionnaire. Age distribution among the categories is normal.

One might say that gender is also a base for comparison. While some research support this ascertain, there is still considerable research to be undertaken before arriving to a conclusion or a differential sex response to certain hazards or agents. Results with regards to the effect of gender are a bit more complex and not very consistent (Frankenhaeuser *et al.*, 1991). Women represent a large proportion of workers employed in health care services. Health care workers receive low remuneration and face difficult working conditions and numerous occupational safety and health hazards including work-related diseases of a complex multifactorial nature such as musculoskeletal disorders, cardiovascular diseases, psychosomatic and mental health disorders, occupational cancer, respiratory diseases, neurotoxic effects and other illnesses caused by chemical agents. Women, as health workers, are also in a special situation concerning work overload as most of the time they are taking care not only of their full-time jobs, but also of a large share of housework (Forastieri, 2000). Numerous studies on stress and work-related disorders have been carried out in recent years, particularly in some Scandinavian countries and in the USA, in which biological differences in physiological response to stress between men and women have been discussed, particularly concerning prevalence and incidence of coronary heart disease. Similarly other studies refer to a different physiological response of women to chemical agents. For these reasons, we have decided not include gender as a control variable in this study.

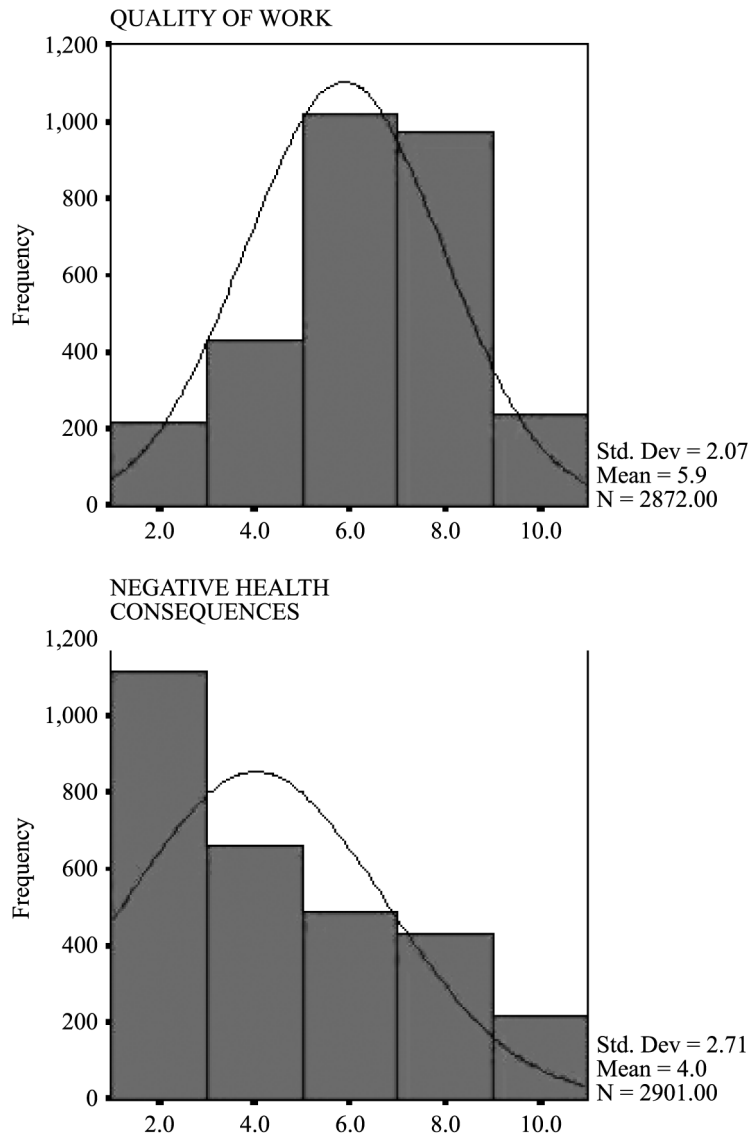
*Dependent variables.* The dependent variables pertaining to the concept of professional quality of working life was rendered operational via two general questions about self perception of overall quality of work life (All in all, the overall quality of my working life is) on one hand, and negative health consequences (All in all my work has negative consequences over my health), on the other hand. Each was represented by a general single item. Some, but rather low correlation is found for these dependent variables ( $r = 0.29$ ) and consequently, each was treated separately in the subsequent analyses. QWL has normal distribution with a mean of 5.9 and a standard deviation of 2.7; NHC variable has a quasi normal distribution (skewed to the left of the scale) with a mean of 4.0 and standard deviation of 2.71 (see Figure 3).

## Results

The questionnaires were designed to gather information about primary care centers employees' perceptions. We wanted to find out whether several employment relationships climate dimensions has a significant meaning for employees' well being. Specifically, the model links intrinsic and extrinsic work demands, motivation and capabilities, and supervisory support with QWL and NHC. The model and associated hypotheses were tested via several statistical tests.

First, we took a preliminary step to test the meaning of age to the dependant variables. Table I displays the ANOVA analysis for both dependent variables on age. Results show that age is significantly related to overall quality of work life (QWL) but not to negative health consequences (NHC). Post hoc test shows that, by and large, younger workers manifests lower quality of work lives than older workers.

Then, a stepwise regression analyses on each of the dependent variables for the 2002 sample was done and results are displayed in Tables II and III. In the third step,



**Figure 3.**  
Mean, standard deviation  
and general distribution of  
the two criteria

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similar analyses were conducted for the 1995 and 2003 data and yielded quasi identical results, which reduces the possibility of an artifact. That is to say that the same variables entered in the same order to the equations and the total explained variance was found to be similar. The primary hypothesis proposed that supervisor support, intrinsic and extrinsic job demands, as well as motivation predicts overall quality of working life; and negative health consequences, for professional's health care employees operating in the Catalan Public Health System.

**Table I.**  
ANOVA results on age

	Sum of squares	df	Mean square	F	Sig.
<i>Overall quality of work life (QWL)</i>					
Between groups	120.640	4	30.160	7.138	0.000
Within groups	11036.886	2612	4.225		
Total	11157.525	2616			
<i>Negative health consequences (NCH)</i>					
Between groups	40.739	4	10.185	1.410	0.228
Within groups	19081.109	2641	7.225		
Total	19121.849	2645			

Table II, thus, presents a regression analysis on QWL as the criterion variable. The regression model was significant and revealed that  $\beta$  for all of our research variables were noteworthy and in the expected direction. The  $R^2$  of the overall model increased significantly from 0.208 to 0.303, with significant change in every step, which demonstrated significant results. Specifically, results based on Table II shows that all three predictors enter the equation to explained over 30 per cent ( $R^2 = 0.303$ ) of the variance in QWL. This is relatively high given the large sample size ( $n = 2,926$ ). It shows that supervisory support and encouragement is the relative most important factor explaining the quality of work life for professionals in the health sector (more than 20 per cent of the explained variance). Job demands, enter the equation next (2nd step) and has an adverse effect on QWL (negative Beta). Yet, it only adds 6 per cent to the explained variance. Finally, it has been found that the person level of motivation, capacity and resources, albeit its theoretical importance in various stress models (including the Karasek), plays only marginal role in explaining the quality of work life (less than 4 per cent). In subsequent analysis, where age was controlled for, it has substituted the later. The conclusion is that the key factor in explaining quality of life for professionals in the health sector is the quality and support of the supervision.

Table III presents findings for a regression analysis where NCH is used as the criterion. The results partially support our hypothesis nevertheless, revealed a slightly different story. The results showed that only intrinsic and extrinsic job demands and supervisory support significantly predicted NCH. The change in  $R^2$  between the model 1 and model 2 was increased significantly from 0.131 to 0.161. The results show that predicting negative health impact is a bit more complicated. First, the saturated model which includes the same predictors, explains much less variance than the quality of working life (16 per cent versus 30 per cent respectively); the key predictor is represented by feelings of overwhelming intrinsic and extrinsic job demands (16 per cent), followed by lack of supervisory support.

In sum, the findings displayed in Tables II and III, indicate that the effects were different for the two dependant variables, QWL and NCH. With regard to QWL, the insertion of motivation and capabilities into the model change the explanation significantly. By contrast, with regard to NCH, the effect of this practice dropped to insignificance and the weight of beta decreased. These findings indicate that motivation and capabilities serves as important variable only for QWL and not for NCH.

Finally, the indicator of perceived Negative Health Consequence is a cardinal outcome in assessing the professional quality of life. It is assumed that albeit the perception of it and the possibility of artifact, this indicator are rather more meaningful

**Table II.**  
Stepwise multiple  
regression analysis on  
QWL as the dependent  
variable

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Std. error of the estimate	Change statistics R <sup>2</sup> change	F change	df2	Sig. F change
1 <sup>a</sup>	0.456	0.208	0.208	1.83	0.208	587.710	2235	0.000
2 <sup>b</sup>	0.517	0.267	0.267	1.76	0.059	180.612	2234	0.000
3 <sup>c</sup>	0.551	0.303	0.302	1.72	0.036	115.131	2233	0.000

Notes: <sup>a</sup> Predictors: (constant), supervisory support and encouragement; <sup>b</sup> Predictors: (constant), supervisory support and encouragement, intrinsic and extrinsic job demands; <sup>c</sup> Predictors: (constant), supervisory support and encouragement (beta = 0.412), intrinsic and extrinsic job demands (beta = - 0.259), motivation, capabilities and resources (Beta = 0.198)

and valid for employees working themselves in the health field. In order to test that, we have employed a discriminate analysis in applying the findings of 2002 both retrospectively (1995 sample) and prospectively (2003 sample) in order to find the correctness of the model. The rational of Median split had been proposed by several scholars in its application to discriminate analysis as a way to separate distinct groups (see for example: Hubert and Van Driessen, 2002; Hawkins and McLachlan, 1997; He and Fung, 2000).

Discriminant analysis is a multivariate statistical procedure which analyzes differences between mutually exclusive groups through linear relationships between variables to create the largest distance between the groups. This procedure was used to determine how the low score NHC group (hereafter group 1) differ from the high score NHC group (hereafter group 2). The key measures of effectiveness used to determine the best discriminant function are eigenvalue, Wilks' lambda and percent correctly classified. Wilks' lambda has a range between "1.0" and "0.0", with values close to zero indicating a function providing the best separation between groups. Wilks' lambda was selected over alternative measures due to its close underpinnings to Analysis of Variance, using the ratio of the within-groups sum of squares to the total groups sum of squares. This yields the proportion of the total variance in the discriminant scores not explained by differences among groups.

Table IV summarizes the results of the classification for each of the sample used (1995 and 2003). Wilks - Lambda significance was found earlier and thus all variables

Model	<i>R</i>	<i>R</i> <sup>2</sup>	Adjusted <i>R</i> <sup>2</sup>	Std. error of the estimate	<i>R</i> <sup>2</sup> change	<i>F</i> change	df2	Sig. <i>F</i> change
1 <sup>a</sup>	0.362	0.131	0.131	2.55	0.131	367.996	2444	0.000
2 <sup>b</sup>	0.401	0.161	0.160	2.50	0.030	234.682	2443	0.000

**Notes:** <sup>a</sup> Predictors: (constant), intrinsic and extrinsic job demands; <sup>b</sup> Predictors: (constant), intrinsic and extrinsic job demands (Beta = 0.369), supervisory support and encouragement (Beta = - 0.174)

**Table III.**  
Stepwise multiple regression analysis on negative health consequences (NCH) as the dependent variable

Actual group	Number of cases		Predicted group membership	
	1995 survey	2003 survey	1995 survey	2003 survey
Group 1: NHC Lower scores on negative health consequences	1112	3642	Correct clasification 791 (71.1%) Incorrect clasification 322 (28.1%)	Correct clasification 2681 (71.6%) Incorrect clasification 1004 (24.6%)
Group 2: NHC Higher scores on negative health consequences	1146	4087	Correct clasification 823 (71.9%) Incorrect clasification 321 (28.9%)	Correct clasification 3063 (75.4%) Incorrect clasification 961 (26.4.6%)

**Table IV.**  
Discriminant analysis classification results

were used in the discriminant calculations. The table shows the relative validity of our predictive model because the proportion of the correct classifications of cases is rather very high and considering the very large sample sizes. Of the 1,112 cases in the data of 1995, one can observe that 791 were predicted correctly to be members of Group 1 (71.1 per cent of lower NHC score), while 1,145 cases or (71.9 per cent of the higher NHC score) were correctly assigned to Group 2. Similarly, and based on the 2003 survey (total valid  $n = 7,729$ ), we find that 2,661 of a total of 3642 (73.6 per cent) were identified correctly in group 1, and only (24.6 per cent) were misclassified. As for group 2 (the higher NHC score), the overall percentage of cases classified correctly is 75.4 per cent (3,083 of a total of 4,087).

### **Discussion and conclusions**

The present research focused on examining the effect of supervisor support, intrinsic and extrinsic job demands, as well as motivation on overall quality of working life; and negative health consequences. In accordance with the ideas of some researchers (Karasek, 1989, 1990; Johnson and Hall, 1988; Schaubroeck and Fink, 1998) we assumed that the relationship between these variables would be significant. By and large, the results of our investigation support our prediction although some slight variations were noted.

The first finding was that all the three independent variables, had a significant direct effect on QWL. These findings are consistent with previous findings for the health sector as reported by MacDonald *et al.* (2001), Van Ameringen *et al.* (1988), Arsenault *et al.* (1991) and Dolan *et al.* (1992). In addition, these practices represent three different types of relationships within the organizational setting. Supervisory support represents direct and accessibility, job demands represents pressure and more role conflict, and motivation and capabilities represents satisfaction. These practices somewhat complement each other, since they reflect perceptions of employees on different kinds of the employment relationship climate. Clearly, satisfaction from these relationships becomes relevant to and affects perceptions of QWL in the specific organization.

Another interesting finding was that only two of our independent variables, job demands and supervisory support, had a significant direct effect on NCH. Surprisingly a person's motivation capabilities and resources did not enter the equation in the 2002 Survey. Nevertheless, these variables did enter the equation significantly in the third step both in the 1995 and the 2003 surveys. Given the overwhelming suggestions that the three independent factors act simultaneously and in various magnitudes in explaining the Negative Health Outcomes, they had been employed in the saturated discriminant analysis that was applied to the 1995 and the 2003 samples (Table IV).

The relatively high percentage of correct classifications 71.5 per cent (for the 1995 survey) and 72.3 per cent (for the 2003 survey), proposes that the model is rather valid in predicting negative health perceptions of employees working in the state run health sector in Catalonia.

In conclusion, the results suggest that regardless of individual's motivation, capabilities and resources, a supportive work culture and careful considerations to the design, quality and quantity of work demands may have significant impact on the feelings towards one quality of working life as well as on health consequences in this health sector. Because stress generated by high job demands and lack of supervisory

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support is both costly and painful to individuals and organizations, it is important that we learn how to *prevent* it, or more precisely how to manage it. In fact, since in most circumstances we cannot avoid stressors, than emphasis should be placed on the management of this phenomenon in order to increase individual's health and contribute to organizational effectiveness. A poor manager in the health sector may unwittingly present his employee with job stress factors, such as high demand/low control, role ambiguity/conflict, and unclear expectation. Low social support, at its worst, is expressed when conflictual interpersonal relationships exist, especially with a supervisor.

With respect to supervisory and social support, management may choose to implement strategies aimed at the health and wellbeing of its professional staff by promoting supervisor and co-worker communication and support. An important initial step may require the health administration leaders to conduct a comprehensive self-assessment, identifying problem areas in communication, hierarchy and leadership.

### Limitations and future research

The study has several limitations. The first limitation is that the study was undertaken within a single country and referred only to primary care centers employees in the Catalan Health Organization. It would be more constructive to examine this issue in a broader perspective and focus on several countries as well as other types of organizations and industries, such as high-tech.

Another limitation of the study may include the unidimensionality of the dependent measures used and perhaps the possibility for having a problem of common "method-Variance" for the cross sectional data analyses of the 2002 survey. Nonetheless, as to the first issue, we recognize the limitation of the criteria but we think that professionals working in the health sector understand the meaning of negative health outcome, and for this reason, albeit the single item, the short interval test-retest reliability shows rather high consistency ( $r = 0.69$ ). In fact, given the secondary level analyses, the researchers could not do anything in improving the construct and having the dependent variables being measured with multi-item. As to the possibility of common method variance, the retrospective and longitudinal design of the study normally tackle this issue along the line suggested by renown occupational stress scholars and psychometric experts (Ganster *et al.*, 1986; Jackson, 1983; Schaubroeck *et al.*, 1992; Spector *et al.*, 1988; Spector, 1992; Podsakoff *et al.*, 2003). In fact, Podsakoff *et al.* (2003) names this procedure as one of the remedies recommended to reduce common method biases in behavioural research.

We are also aware that we simplify Karasek's demands-control-support model, nevertheless, the intention of this study was not to re test the aforementioned model, but to be inspired by it in identifying some key variables that are connected to QWL and Negative health outcomes. More precisely, in this study, we distinguished between intrinsic and extrinsic demands in order to achieve what we consider to be a more suitable model.

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#### **Corresponding author**

Simon L. Dolan can be contacted at: [Simon.dolan@esade.edu](mailto:Simon.dolan@esade.edu)