

# A Proposed Instrument for the Assessment of Job Satisfaction in Greek Mental NHS Hospitals

Georgios Labiris · Kleoniki Gitona ·  
Vasiliki Drosou · Dimitrios Niakas

Received: 15 November 2007 / Accepted: 6 February 2008 / Published online: 8 March 2008  
© Springer Science + Business Media, LLC 2008

**Abstract** Since its introduction in 1983, the Greek NHS is under an almost constant reform, aiming improvement on the efficiency and the quality of provided services. The national program of psychiatric reform “Psychargos” introduced new models of therapeutic approach to the care of the mentally ill, that required expansion of the existing roles and development of new roles of the healthcare staff. Consequently, the efficient management of the healthcare workforce in Greek mental facilities was identified as a primary determinant of the successful implementation of the program. Primary objective of this study was the development of a research framework for the assessment of job satisfaction in Greek Mental Health Hospitals. Among the objectives was the evaluation of the capacity of the underlying motivators and hygiene factors and the identification of potential correlations of the global job satisfaction and the motivation and retention factors with the demographic, social and occupational characteristics of the employees. A custom questionnaire was developed, based on Herzberg two-factor theory, after a systematic review of the relevant literature. The instrument was constructed by two parts and 37 items. Ten items addressed the sociodemographic characteristics of the subjects, while the remaining 27 items were distributed in 11 subscales which addressed the global satisfaction index and the “retention” and the “motivation” variables. The instrument

was validated by means of the Cronbach alpha for each subscale and by confirmatory factor analysis. The study was conducted at the Public Mental Hospital of Chania (PMHC). From the 300 employees of the PMHC, 133 subjects successfully responded to the questionnaire (response rate, 44.3%). In accordance to former surveys, subjects presented average scores in the global satisfaction index (GSI). The professional category of the employee was identified as the primary determinant of the GSI. Nurses presented statistically significant lower scores in comparison to the rest of the employees. Strong Pearson correlations were detected between GSI and “working conditions”, “interpersonal relations”, “organization”, “salary” and “supervision” factors. The retention factors presented stronger impact on GSI in comparison to the motivation ones. The results of the study indicate that the proposed instrument presents satisfactory validity and reliability for the assessment of job satisfaction in Greek mental NHS hospitals.

**Keywords** Motivation · Herzberg · Job satisfaction · Validation · LISREL · Mental hospital · Greece

## Introduction

Greek NHS attempted a psychiatric care reform in 1984 after special funding by the European Union. The corresponding national program [1] of “Psychargos” identified the primary objectives of the reform, which were to be implemented in two phases [2]. Among these objectives was the introduction of community-based health structures, community after-care programs, and comprehensive training programs for the mental healthcare providers. However,

G. Labiris (✉) · K. Gitona · D. Niakas  
Hellenic Open University,  
Patras, Greece  
e-mail: labiris@usa.net

V. Drosou  
Intermedico Network,  
Athens, Greece

unbalanced distribution of the funds and suboptimal management of the healthcare workforce resulted in significant delays and inefficiencies in the implementation of the program [3, 4].

Regarding human resources management in NHS facilities, former investigators suggested that higher levels of job satisfaction are associated with reduced levels of employee turnover, absenteeism and thefts at work. Moreover, job satisfaction contributed to increased confidence, to loyalty and ultimately to improved quality in the output of the employed. A series of studies attempted to associate the quality and the efficacy in the provision of care with job satisfaction. In fact, relevant literature indicated that hospital staff has difficulties in meeting the needs of their patients when they feel that their needs are not satisfied in their working environment [5].

Job satisfaction has been defined as the extent to which employees like their jobs [6]. Other researchers suggested that job satisfaction is determined by the overall sum of the positive and the negative perceptions of the employees regarding their working environment [7]. These subjective perceptions reflect the capacity of a series of feelings that are directly associated with the working environment; among them, the feeling of fulfilment, of gratification and of enjoyment. The importance of job satisfaction has been indicated in a series of studies in different working environments [8, 9]. In these studies, job satisfaction has been suggested as a direct determinant of the quality of the product [10].

Among the well known theorists that attempted to explain what satisfies and what dissatisfies the employees were Herzberg and co-workers. Their two-factor theory was introduced in 1959. In brief, it is a theory of external motivation since the manager controls the factors which contribute to job satisfaction or dissatisfaction [11, 12]. The research that led to Herzberg's theory was based on interviews with 200 Pittsburgh accountants and engineers who were asked to recall a time when they felt exceptionally happy with their jobs and a time when they felt exceptionally negative with their jobs. According to Herzberg and co-workers, job satisfaction was determined by two different sets of factors. One set of factors (satisfiers or motivators) resulted in satisfaction when in they were present in adequate quantities. Six motivators were identified in Herzberg's original study (achievement, recognition, advancement, the work itself, the possibility of growth and responsibility. The other set of factors (hygiene or maintenance factors) caused dissatisfaction when they were deficient. Among the hygiene factors that were identified were: salary, interpersonal relations, supervision, organization policy and administration, working conditions and job security. Both motivators and hygiene factors determined job satisfaction, however neither the absence of motivators necessarily resulted in job dissatisfaction nor the presence

of hygiene factors necessarily resulted in high levels of job satisfaction.

The two-factor theory extended the knowledge regarding the motivation of employees. It provided a conceptual framework regarding the factors that enhance motivation and prospectively performance. Within this context, primary objective of this study was the development of an instrument for the assessment of job satisfaction in Greek Mental Health Hospitals. Among the objectives was the evaluation of the capacity of the underlying motivators and hygiene factors and the identification of potential correlations of the global job satisfaction and the motivation and retention factors with the demographic, social and occupational characteristics of the employees.

## Material–methods

### Study design

The study was conducted between January and February 2007 at the Public Mental Health Hospital of Chania (PMHC). Study objectives and study design was approved by the scientific committee of the hospital. The PMHC is a NHS mental facility with 300 employees. All employees (31 physicians, 132 nurses, 53 employees belonging to administrative personnel, 35 technicians and 67 employees belonging assisting personnel), were recruited for the sake of the study and administered a custom self-reported questionnaire. The questionnaire was accompanied by a letter describing the objectives of the study, assuring that participation was voluntary and anonymous and no penalties or benefits could be gained by participating to the study. 133 subjects responded and successfully completed the questionnaire (response rate, 44.3%). Response rates for physicians were, 32.3%; for nurses, 55.3%; for administrative staff, 71.4%; technicians, 18.0%; assisting personnel, 28.4%.

### Research instrument

For the sake of the study, a survey instrument (questionnaire) was developed after conducting a systematic review of the literature pertinent to the subject in question. The search terms that were used in "Medline" and "Ingenta" search engines were combinations of the keywords "job satisfaction", "motivation", "employee", "hospital" and "questionnaire" in the title, in the keywords, and/or in the abstract. The timeframe of the search was publications up to 2006. The review of the literature resulted in 35 publications. Among them the most relevant to Herzberg's theory were selected. The questionnaires and scales used in these studies provided the necessary framework for the construc-

tion of the questionnaire. Closed-ended questions in the form of a five point Likert scale, in which 1 corresponded to “agree strongly”, 2 to “agree”, 3 to “neither agree nor disagree”, 4 to “disagree”, and 5 to “disagree strongly” were used in order to prevent misleading results in the interpretation of the responses. In accordance to former surveys, higher values in the Likert scales of the items were inversely correlated to the motivation and retention factors. The development procedure of the instrument was supervised by two human-resources experts who provided valuable feedback regarding items’ clarity and appropriateness.

The instrument was constructed by two parts and 37 items. The first part of the instrument consisted of ten items regarding to social, demographic and job related questions, addressing age, gender, education, position, years of experience, income, and family status. The second part of the instrument consisted of 27 items that were distributed in 11 subscales: [global job satisfaction (one item), achievement (three items), recognition (one item), advancement (one item), work-itself (two items), responsibility (one item), organization policy (five items), supervision (two items), job security (three items), interpersonal relations (four items), salary (four items)].

**Results**

Prior to the administration of the instrument to the staff of the PCMH it was pilot-tested in a random sample of 15 employees. The pilot-testing showed that all items were simple and easy to complete, the questionnaire was short in duration (approximately 10 min) and generally accepted by the interviewees.

Reliability and validity of the instrument

Reliability of the instrument was assessed by evaluating the Cronbach’s alpha for the items in each subscale. The results regarding the reliability of the instrument are presented in Table 1. All subscales presented Cronbach alpha scores between 0.63 and 0.81, while Pearson correlation coefficients of the items to the subscales ranged between 0.65 and 0.89.

On the other hand, validity of the instrument was evaluated by means of confirmatory factor analysis (CFA). A goodness of fit index (GFI) of 0.85 or above was considered as satisfactory [13]. As presented in Table 1, all subscales presented GFI scores ranging from 0.84 to 0.94.

**Table 1** Validation of the instrument

	Factor	Related instrument items	Correlation with the factor ( <i>r</i> Pearson)	Goodness of fit index (GFI)	Cronbach $\alpha$
Motivation <sup>a</sup>	Achievement	6	0.78	0.86	0.67
		18	0.65		
		24	0.7		
	Work itself	7	0.89	0.84	0.63
		10	0.76		
Retention	Organization policy and administration	2	0.75	0.96	0.81
		3	0.81		
		4	0.7		
		11	0.71		
	Supervision	12	0.86	0.91	0.7
		13	0.83		
		14	0.87		
	Working conditions and job security	5	0.81	0.9	0.68
		17	0.78		
		23	0.77		
		25	0.78		
Interpersonal relations		8	0.64	0.92	0.7
		15	0.63		
		26	0.75		
		19	0.79		
		20	0.81		
Salary		21	0.81	0.94	0.81
		22	0.78		
		22	0.78		

<sup>a</sup> Recognition, responsibility and advancement are related to items 9, 16 and 27, respectively

The above-mentioned scores suggested that the instrument presented comparable reliability and validity to the ones used in former surveys, and it was distributed to the subjects.

### Exploratory analysis

Exploratory data analysis was conducted, using SPSS software package version 14 (SPSS® Inc, Chicago, IL, USA), to examine the central tendency, the variability and the distribution of all items. Subjects' responses on items 1–27 were processed as continuous variables (scalar) while those on items 28–37 as categorical. Motivation and retention factors were estimated as the average of the items constructing them. Descriptive statistics for global satisfaction as well as for motivation/retention factors are summarized in Table 2.

Statistical analysis regarding the subscale “global job satisfaction” indicated that the employees, who participated in the research, expressed rather neutral feelings (neither satisfied nor dissatisfied). Descriptive statistics were also calculated for the different groups of the employees defined by the social-demographic and job related characteristics. Pearson's correlation coefficients are presented in Table 3. The professional category of the employee was identified as the most important determinant of the subscale “global job satisfaction”. Nurses presented higher levels of job dissatisfaction in comparison to the rest of the groups (Fig. 1). Females presented higher levels of dissatisfaction, as well (Fig. 2). On the hand, age and salary had a minor, non-statistical significant impact on the global satisfaction index (Figs. 3 and 4). In accordance to the aforementioned statements, the professional category of the employee presented statistical significant impact on the majority of the factors [i.e. recognition ( $r=0.256$ ), work it self ( $r=0.199$ ), working conditions ( $r=0.229$ ), interpersonal relations ( $r=0.212$ ), salary ( $r=0.394$ )] (Figs. 6 and 7). Regarding the rest of the correlations, the “responsibility” factor was

strongly associated with the age ( $r=0.443$ ), the income ( $r=0.330$ ) and the number of offsprings of the employee ( $r=0.256$ ). On the other hand, further to the professional category of the employee, the “interpersonal relations” factor was associated with the educational background ( $r=0.206$ ).

Regarding the motivation and retention factors, the results are presented in Table 2. The motivation factors of “advancement” (4.06) and “recognition” (3.47) were identified as the primary contributors of the employees' dissatisfaction, while the factors “work itself” (2.27) and the “achievement of objectives” (2.30) were identified as the primary contributors of satisfaction.

On the other hand, the retention factors of “organization-policy and administration” (3.05), “supervision” (3.13), “interpersonal relations” (3.18) and “salary” (3.32), presented low scores suggesting inadequate neutralization of the job dissatisfaction.

### Correlation analysis

Pearson correlation coefficients ( $r$ ) between global job satisfaction and motivation/retention factors (Table 4), indicated weak to moderate dependencies ( $r$  ranges from 0.207 to 0.803). Global satisfaction presented relatively strong correlations with the motivation factor concerning with the work itself ( $r=0.667$ ), as well as with the retention factors dealing with working conditions-security ( $r=0.710$ ), organization-policy-administration ( $r=0.634$ ) and interpersonal relations ( $r=0.647$ ).

### Confirmatory factor analysis

It is known that confirmatory factor analysis (CFA) is a statistical method that seeks to determine if the number of factors and the capacity of measured (observable) variables on them conform to what is expected on the basis of a pre-established theory [14]. These measured variables are

**Table 2** Descriptive statistics regarding job satisfaction and motivation/retention factors

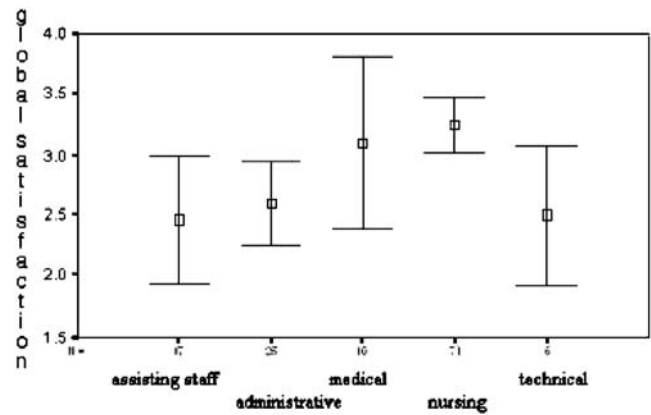
	Number	Minimum	Maximum	Mean	Median	Standard deviation	Confidence interval for the mean (95%)	
Global job satisfaction	129	1	5	2.97	3	0.99	2.89	3.07
Achievement	131	1	5	2.3	2.33	0.73	2.22	2.35
Recognition	129	1	5	3.47	4	1.17	3.29	3.51
Advancement	128	1	5	4.06	4	1.01	3.83	4.04
Work itself	132	1	5	2.27	2	0.82	2.2	2.34
Responsibility	132	1.5	5	2.81	2.67	0.58	2.77	2.87
Organization-policy-administration	132	1	4.8	3.05	3	0.89	2.97	3.13
Supervision	129	1	5	3.13	3	0.94	3.06	3.23
Working conditions-security	132	1	5	2.89	2.67	0.92	2.81	2.97
Interpersonal relations	132	1	5	3.18	3.25	0.79	3.12	3.26
Salary	130	1	5	3.32	3.29	0.95	3.25	3.42

**Table 3** Pearson correlations among demographic characteristics and global satisfaction and motivation/retention factors

	Global job satisfaction	Achievement	Recognition	Advancement	Work itself	Responsibility	Organization-policy-administration	Supervision	Working conditions	Interpersonal relations	Salary
Age	-0.087	-0.033	-0.055	0.018	-0.147	0.443 <sup>b</sup>	-0.071	0.079	-0.209 <sup>a</sup>	-0.002	-0.101
Sex	0.105	0.044	0.036	0.117	0.278 <sup>b</sup>	-0.077	0.119	0.032	0.057	0.003	-0.034
Professional category	0.173 <sup>a</sup>	0.015	0.256 <sup>b</sup>	0.13	0.199 <sup>a</sup>	0.12	0.097	0.108	0.229 <sup>b</sup>	0.212 <sup>a</sup>	0.394 <sup>b</sup>
Years at work	0.033	-0.053	0.026	0.07	-0.061	0.374	-0.052	0.129	-0.175	0.017	-0.022
Income	0.019	0.044	0.077	0.113	0.083	0.330 <sup>b</sup>	0.116	0.121	-0.052	0.086	0.037
Educational background	-0.149	-0.116	-0.054	-0.044	-0.213 <sup>a</sup>	0.174	-0.261 <sup>b</sup>	-0.163	-0.191 <sup>a</sup>	-0.206 <sup>a</sup>	-0.052
Marital Status	0.131	0.066	0.084	-0.037	0.095	0.104	0.102	0.068	0.155	0.022	0.074
Number of offsprings	-0.133	-0.11	-0.112	-0.064	-0.097	0.256 <sup>b</sup>	-0.193 <sup>a</sup>	-0.048	-0.164	-0.08	-0.003

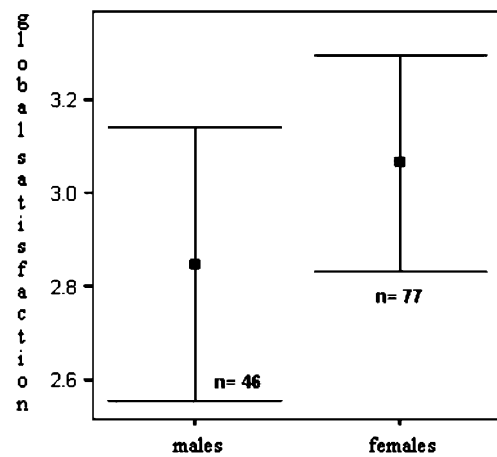
<sup>a</sup>Correlation is significant at  $\alpha=0.05$  (two side test)

<sup>b</sup>Correlation is significant at  $\alpha=0.01$  (two side test)



**Fig. 1** Impact of professional category on job satisfaction

selected according to the theory and factor analysis is used to see if they load as predicted on the expected number of factors. However, an assumption is required that each factor is associated with a specific subset of measured variables. Modern structural equation modelling packages like the LISREL (linear structure equation model) that was used in this study typically attempt to model causal relationships among latent variables. In brief, such models have two parts: (a) a measurement model which supposes that each latent variable is linked to its own set of indicators through a factor model and (b) a structural model which specifies the linear relationships among the latent variables and the depended ones. Such a model is fitted by matching the observed and theoretical covariance matrices. In our study both the construction of measurement and structural models were based on Herzberg’s theory. The “motivation” latent variable was associated with the “achievement”, the “recognition”, the “advancement”, the “work itself” and the “responsibility” measured variables, by a linear equation. On the other hand, the “retention” latent variable was associated with the “organization-policy-administration”, “supervision”, “working conditions-security”, “interpersonal relations” and “salary”, measured variables, by linear



**Fig. 2** Impact of gender on job satisfaction

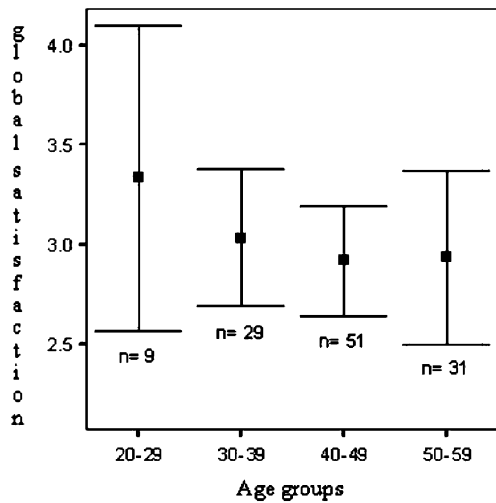


Fig. 3 Impact of age on job satisfaction

equation, as well. The graphical representation of the aforementioned measurement model is presented in Fig. 5.

The adequacy of the model was evaluated by means of the  $\chi^2$  per degrees of freedom (3.98), of the comparative fit index (CFI) that presented a value of 0.9 (range, 0–1) and of the root mean square residual (0.11). All aforementioned tests indicated that the model had a good fit.

Regarding the “motivation” latent variable, higher values were observed in the “advancement” (0.84) and “recognition” (0.71) measured variables, followed by “work itself” (0.44), the “responsibility” (0.32) and the “achievement” (0.16) variables. Regarding the “retention” latent variable, higher values were observed in the “salary” (0.74), “supervision” (0.73) and “interpersonal relations” (0.72) measured variables, followed by “working conditions-security” (0.66) and “organization-policy-administration” (0.51) variables. It becomes obvious that contrary to the

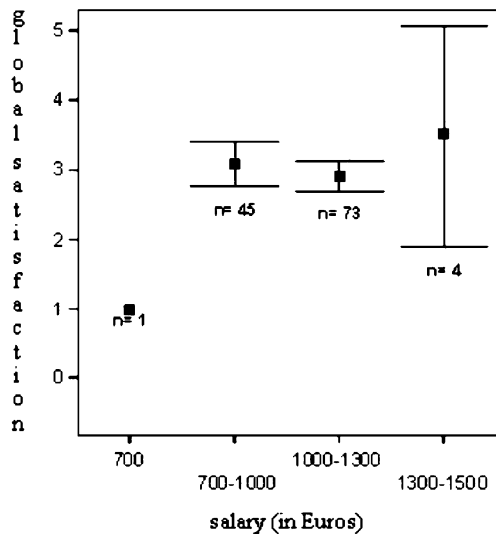


Fig. 4 Impact of salary on job satisfaction

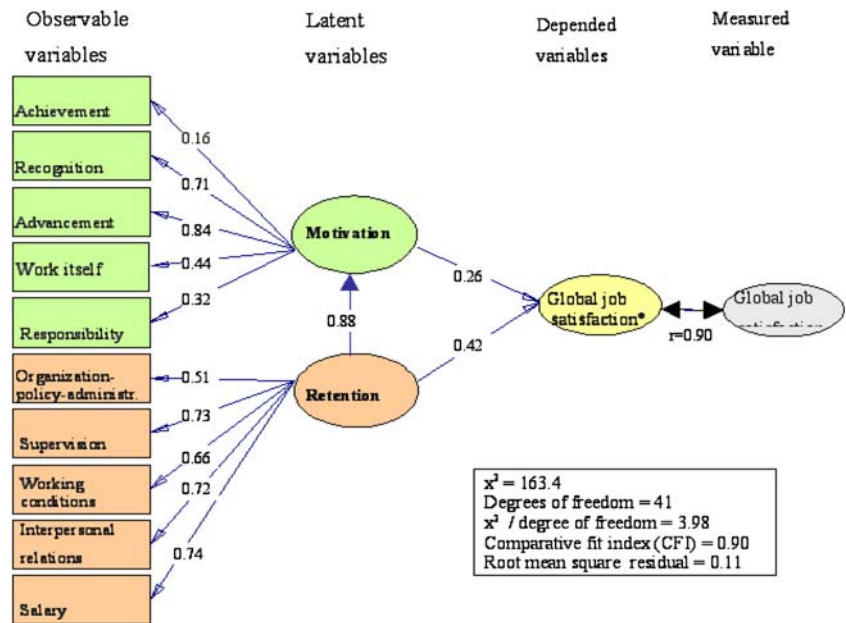
Table 4 Pearson correlation coefficients between global satisfaction and motivation/retention factors

	Global job satisfaction	Achievement	Recognition	Advancement	Work itself	Responsibility	Organization-policy-administration	Supervision	Working conditions-security	Interpersonal relations	Salary
Global job satisfaction	1										
Achievement	0.502 <sup>b</sup>	1									
Recognition	0.563 <sup>b</sup>	0.391 <sup>b</sup>	1								
Advancement	0.473 <sup>b</sup>	0.253 <sup>b</sup>	0.695 <sup>b</sup>	1							
Work itself	0.667 <sup>b</sup>	0.529 <sup>b</sup>	0.443 <sup>b</sup>	0.343 <sup>b</sup>	1						
Responsibility	0.316 <sup>b</sup>	0.207 <sup>a</sup>	0.212 <sup>a</sup>	0.237 <sup>b</sup>	0.393 <sup>b</sup>	1					
Organization-policy-administration	0.634 <sup>b</sup>	0.638 <sup>b</sup>	0.689 <sup>b</sup>	0.560 <sup>b</sup>	0.663 <sup>b</sup>	0.240 <sup>b</sup>	1				
Supervision	0.584 <sup>b</sup>	0.464 <sup>b</sup>	0.669 <sup>b</sup>	0.536 <sup>b</sup>	0.466 <sup>b</sup>	0.295 <sup>b</sup>	0.803 <sup>b</sup>	1			
Working conditions-security	0.710 <sup>b</sup>	0.340 <sup>b</sup>	0.605 <sup>b</sup>	0.554 <sup>b</sup>	0.533 <sup>b</sup>	0.180 <sup>a</sup>	0.557 <sup>b</sup>	0.520 <sup>b</sup>	1		
Interpersonal relations	0.647 <sup>b</sup>	0.464 <sup>b</sup>	0.685 <sup>b</sup>	0.676 <sup>b</sup>	0.429 <sup>b</sup>	0.346 <sup>b</sup>	0.665 <sup>b</sup>	0.698 <sup>b</sup>	0.604 <sup>b</sup>	1	
Salary	0.498 <sup>b</sup>	0.1	0.414 <sup>b</sup>	0.472 <sup>b</sup>	0.346 <sup>b</sup>	0.524 <sup>b</sup>	0.297 <sup>b</sup>	0.308 <sup>b</sup>	0.571 <sup>b</sup>	0.577 <sup>b</sup>	1

<sup>a</sup>Correlation is significant at  $\alpha=0.05$  (two side test)

<sup>b</sup>Correlation is significant at  $\alpha=0.01$  (two side test)

Fig. 5 LISREL path diagram



“motivation” measured variables that presented significant fluctuations, the “retention” measured variables presented narrow variation (Figs. 6 and 7). The interaction between motivation and retention was estimated to 0.88. The contribution of motivation (0.26) and retention (0.42) to global job satisfaction is also shown in Fig. 3. According to our results the “retention” variable was the primary determinant of the “job satisfaction” index. On the other hand, the results of the linear model were compared to the results of the item 1 of the instrument that address the global satisfaction index. The estimated correlation coefficient between estimated and measured values was 0.9, which was considered as satisfactory.

**Discussion**

Herzberg’s model of motivation, made a major contribution to understanding the dynamics of job satisfaction [15].

Contrary to former theorists that viewed job satisfaction as unidimensional, Herzberg’s model revealed two distinct continua that affect satisfaction suggesting that job satisfaction and job dissatisfaction are not exact opposites in a single continuum. Each continuum is determined by a different set of factors the motivators and the hygiene factors. Literature suggests that the efficient human resources management and subsequently the organizational performance depend heavily on the proper identification and enhancement of both motivators and hygiene factors.

Since its introduction in 1983, the Greek NHS is under an almost constant reform, aiming improvement on the efficiency and the quality of provided services [16]. The national program of psychiatric reform “Psychargos” introduced new models of therapeutic approach to the care of the mentally ill, that required expansion of the existing roles and development of new roles of the healthcare staff. Consequently, the efficient management of the healthcare workforce in mental facilities was identified as a primary

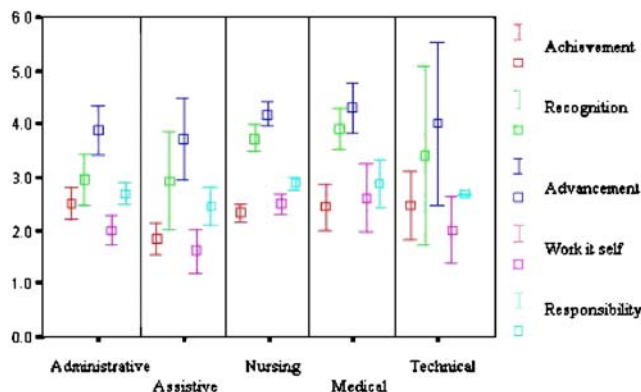


Fig. 6 Impact of professional category on motivation factors

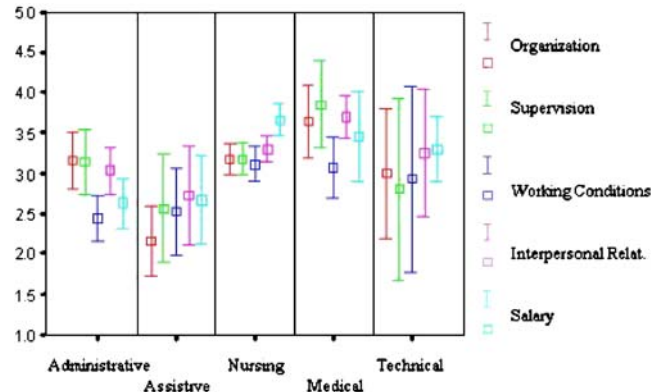


Fig. 7 Impact of professional category on retention factors

determinant of the successful implementation of the program. However, current national legislation regarding the Greek NHS, provides limited ability in the provision of direct incentives to hospital staff for promoting performance. Thus, the identification of the capacity of the factors that contribute to job satisfaction and prospectively to motivation and performance was identified as a necessity. However, extensive literature review provided very few data regarding job satisfaction and staff motivation in Greek NHS [17].

In accordance to the aforementioned statements, primary objective of the study was the development of a valid instrument for the assessment of work-related satisfaction in Greek mental NHS hospitals. Contrary to former investigators [18] that used a combination of motivation theories as their theoretical background in their attempt to investigate the relationship between job satisfaction and performance in Greek NHS, our methodological framework was solely based on Herzberg's two-factor theory. The instrument that was developed for the sake of the study was short in duration and easily accepted by the interviewers. On the other hand, the validation of the instrument indicated adequate reliability, validity and compatibility to the Greek norms.

Regarding the results of the study, the primary outcome was that the employees presented average scores in the global job satisfaction index. Comparable ratings of job satisfaction have been indicated by former investigators in a series of national healthcare systems [19–22]. Moreover, the professional category of the employee was identified as the primary determinant of the job satisfaction index. In fact, the nursing staff presented statistical significant lower ratings in job satisfaction when compared to the rest of the groups. Low ratings of job satisfaction in NHS nursing staff have been indicated in former surveys and comprise a major challenge to NHS authorities [23].

According to the results of the correlation and confirmatory factor analyses, the global satisfaction index was primarily determined by the retention factors, rather than the motivation ones. In fact, the strong Pearson correlations that were encountered between the global satisfaction index and the “working conditions”, the “interpersonal relations”, the “organization” the “salary” and the “supervision” retention factors, have been encountered in the majority of relevant studies. Specifically, job stress, which is an integral component of the working conditions factor has been indicated as a primary determinant of job satisfaction, both in medical [24–26], and nursing staff [27, 28]. On the other hand, the collaboration between nurses and doctors which is an integral component of the “interpersonal relations” factor has been indicated as an important determinant of job satisfaction, as well [29–31]. Accordingly, former surveys indicated “supervision” [32, 33] and “salary” [34–36] as essential determinants of job satisfaction. Moreover, the

“advancement” [37, 38] and “recognition” [39, 40] factors are well known contributors of the motivation and prospectively of the job satisfaction index.

Certain limitations of the study have to be addressed regarding the interpretation of the results. The subjects group consisted of a relatively small number of physicians that successfully responded to the questionnaire. The limited number of physicians may partly explain the relatively low capacity of the “motivation” variable in comparison to the “retention” variable, since a series of motivation factors like the “advancement”, “achievement” and “responsibility” is mainly associated with the medical group. Moreover, the results of the study are valid for an NHS mental hospital. Former surveys indicated that staff in psychiatric hospitals experience a high degree of emotional burden from patients and are likely to present lower job satisfaction scores than healthcare providers working in other disciplines [41, 42]. On the other hand, it is known that the two-factor theory has its inherent limitations, especially when applied in complex, multidisciplinary working environments. However, the contribution of Herzberg's theory and prospectively of the study is that it provides distinct, easily measurable motivation and retention factors that are directly associated with job enrichment interventions in NHS hospitals, like interventions in “skill variety”, in “autonomy”, and in the “feedback” process.

## Conclusion

The results of the study indicate that the proposed instrument presents satisfactory validity and reliability for the assessment of job satisfaction in Greek mental NHS hospitals.

**Competing interests** The authors declare that they have no competing interests.

**Authors' contributions** GL was responsible for designing the study and drafting the manuscript. KG was responsible for conducting the literature review, developing the questionnaire and acquiring the data. VD conducted the statistical analysis. DN was responsible for the conception of the study.

## References

1. Stefanis, C., Madianos, M. G., and Gittelman, M., Recent developments in the care, treatment and rehabilitation of the chronic mentally ill in Greece. *Hospital & Community Psychiatry* 37:1041–1044, 1986.
2. Madianos, M. G., Tsiantis, J., and Zacharakis, C., Changing patterns of mental health care in Greece (1984–1996). *Eur. Psychiatr.* 14:1–4, 1999.



3. Mossialos, E., Allin, S., and Davaki, K., Analysing the Greek health system: A tale of fragmentation and inertia. *Health Econ.* 14:S151–S168, 2005.
4. Kontodimopoulos, N., Bellali, T., Labiris, G., et al., Investigating sources of inefficiency in residential mental health facilities. *J. Med. Syst.* 3:169–176, 2005.
5. Linn, L. S., Brook, R. H., Clark, V. A., et al., Physician and patient satisfaction as factors related to the organization of internal medicine group practices. *Med. Care* 23:1171–1178, 1985.
6. Stamps, P. L., *Nurses and work satisfaction: An index for measurement*, 2nd edition. Health Administration Press, Chicago, IL, 1997.
7. Greenberg, J., and Baron, A., *Behavior in organizations*, 7th edition. Prentice Hall, New Jersey, 2000.
8. Parkes, K. R., Shiftwork and environment as interactive predictors of work perceptions. *J. Occup. Health Psychol.* 4:266–281, 2003.
9. Steinhardt, M. A., Dolbier, C. L., Gottlieb, N. H., et al., The relationship between hardiness, supervisor support, group cohesion, and job stress as predictors of job satisfaction. *Am. J. Health Promot.* 6:382–389, 2003.
10. Shikdar, A. A., and Das, B., The relationship between worker satisfaction and productivity in a repetitive industrial task. *Appl. Ergon.* 6:603–610, 2003.
11. Herzberg, F., Manseur, B., and Synderman, B., *The motivation to work*. Wiley, New York, 1959.
12. Herzberg, F., One more time: How do you motivate your employees. Harvard Business Review, 1968, Jan/Feb.
13. Mak, B., and Sockel, H., A confirmatory factor analysis of IS employee motivation and retention. *Inf. Manage.* 38:265–276, 2001.
14. Kim, J. O., and Mueller, C. W., Introduction to factor analysis: What it is and how to do it. Thousand Oaks, CA: Sage Publications, Quantitative Applications in the Social Sciences Series, No.13., 1978.
15. Byrne, M., The implications of Herzberg's "motivation-hygiene" theory for management in the Irish health sector. *Health Care Manage.* 1:4–11, 2006.
16. Davaki, K., and Mossialos, E., Plus ça change: Health sector reforms in Greece. *J. Health Polit. Policy Law.* 1–2:143–167, 2005.
17. Brokalaki, H., Matziou, V., Tanou, J., et al., Self-rated health, work characteristics and health related behaviours among nurses in Greece: A cross sectional study. *BMC Nurs* 4:8, 2005.
18. Paleologou, V., Kontodimopoulos, N., Stamouli, A., et al., Developing and testing an instrument for identifying performance incentives in the Greek health care sector. *BMC Health Serv. Res.* 6:118, 2006.
19. Kaarna, M., Polluste, K., Lepnurm, R., et al., The progress of reforms: Job satisfaction in a typical hospital in Estonia. *Int. J. Qual. Health Care* 3:253–261, 2004.
20. Woodward, C. A., Shannon, H. S., Cunningham, C., et al., The impact of re-engineering and other cost reduction strategies on the staff of a large teaching hospital. *Med. Care* 37:556–569, 1999.
21. Luthans, B. C., and Sommer, S. M., The impact of downsizing on workplace attitudes. *Group Org. Manage.* 24:46–70, 1999.
22. Curtis, E. A., Job satisfaction: A survey of nurses in the Republic of Ireland. *Int. Nurs. Rev.* 1:92–99, 2007.
23. Zangaro, G. A., and Soeken, K. L., A meta-analysis of studies of nurses' job satisfaction. *Res. Nurs. Health* 4:445–458, 2007.
24. Bovier, P. A., and Perneger, T. V., Stress from uncertainty from graduation to retirement—A population-based study of Swiss physicians. *J. Gen. Intern. Med.* 5:632–638, 2007.
25. Keeton, K., Fenner, D. E., Johnson, T. R., and Hayward, R. A., Predictors of physician career satisfaction, work-life balance, and burnout. *Obstet. Gynecol.* 4:949–955, 2007.
26. Bogue, R. J., Guarneri, J. G., Reed, M., et al., Secrets of physician satisfaction. Study identifies pressure points and reveals life practices of highly satisfied doctors. *Physician Exec.* 6:30–39, 2006.
27. Ernst, M. E., Messmer, P. R., and Franco, M., Nurses' job satisfaction, stress, and recognition in a pediatric setting. *Pediatr. Nurs.* 3:219–227, 2004.
28. Piko, B. F., Burnout, role conflict, job satisfaction and psychosocial health among Hungarian health care staff: A questionnaire survey. *Int. J. Nurs. Stud.* 3:311–318, 2006.
29. Ward, M., and Cowman, S., Job satisfaction in psychiatric nursing. *J. Psychiatr. Ment. Health Nurs.* 5:454–461, 2007.
30. Hendel, T., Fish, M., and Berger, O., Physician conflict management mode choices: Implications for improved collaborative practice. *Nurs. Adm. Q.* 3:244–253, 2007.
31. Rosenstein, A. H., and O'Daniel, M., Disruptive behavior and clinical outcomes: Perceptions of nurses and physicians. *Am. J. Nurs.* 1:54–64, 2005.
32. Begat, I., Ellefsen, B., and Severinsson, E., Nurses' satisfaction with their work environment and the outcomes of clinical nursing supervision on nurses' experiences of well-being—A Norwegian study. *J. Nurs. Manag.* 3:221–230, 2005.
33. Laschinger, H. K., Almost, J., and Tuer-Hodes, D., Workplace empowerment and magnet hospital characteristics: Making the link. *J. Nurs. Adm.* 8:410–422, 2003.
34. French, F., Ikenwilo, D., and Scott, A., What influences the job satisfaction of staff and associate specialist hospital doctors? *Health Serv. Manag. Res.* 3:153–161, 2007.
35. French, F. H., Andrew, J. E., Awramenko, M., et al., Consultants in NHS Scotland: A survey of work commitments, remuneration, job satisfaction and retirement plans. *Scott. Med. J.* 2:47–52, 2004.
36. Janus, K., Amelung, V. E., Gaitanides, M., et al., German physicians "on strike". Shedding light on the most physician dissatisfaction. *Health Policy* 3:357–365, 2007.
37. Crawford, J., and Gressley, D., Job satisfaction in the medical imaging profession: Alleviating the shortage of personnel. *Radiol. Manage.* 2:35–40, 1993.
38. Lamberth, B., and Comello, R. J., Identifying elements of job satisfaction to improve retention rates in healthcare. *Radiol. Manage.* 3:34–38, 2005.
39. Van Ham, I., Verhoeven, A. A., Groenier, K. H., et al., Job satisfaction among general practitioners: A systematic literature review. *Eur. J. Gen. Pract.* 4:174–180, 2006.
40. Takase, M., Maude, P., and Manias, E., Comparison between nurses' professional needs and their perceptions of their jobs. *Aust. J. Adv. Nurs.* 2:28–33, 2005.
41. Garfinkerl, P. E., Bagby, R. M., Schuller, D. R., et al., Predictors of professional and personal satisfaction with a career in psychiatry. *Can. J. Psychiatry* 6:333–341, 2005.
42. Sturm, R., Datapoints: Are psychiatrists more dissatisfied with their careers than other physicians. *Psychiatr. Serv.* 5:581, 2001.