



La Medicina del Lavoro

RIVISTA BIMESTRALE DI MEDICINA DEL LAVORO E IGIENE INDUSTRIALE
ITALIAN JOURNAL OF OCCUPATIONAL HEALTH AND INDUSTRIAL HYGIENE

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Organizational health and quality of life: survey among ambulance nurses in prehospital emergency care

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KEY WORDS

Organizational health; quality of life; ambulance nurses

SUMMARY

Background: *The workplace plays a central role in causing stress and different kinds of syndromes and diseases. More generally, organizational procedures and practices could have an impact on nurses' quality of life. Although several studies have investigated this link, none of them considered nurses working in prehospital emergency care.*

Objectives: *To investigate the role of organizational health factors that affect the quality of life and psychosomatic complaints of ambulance nurses. Method:* *Our sample included 411 ambulance nurses. Workers were administered two questionnaires to assess organizational health and quality of life. Descriptive and correlational analyses were used to test our assumptions. Conclusion:* *Several organizational health dimensions provided an explanation for the complaints reported by nurses working in prehospital emergency care in terms of quality of life and psychosomatic disorders. The results allowed identification of possible interventions focusing on specific duties and organizational aspects that would improve the quality of nurses' health.*

RIASSUNTO

«Salute organizzativa e qualità della vita: indagine tra gli infermieri delle ambulanze territoriali». **Introduzione:** *Il contesto lavorativo gioca un ruolo centrale nel determinare alti livelli di stress e nello sviluppare disturbi di diversa natura. Più in generale i processi e le pratiche organizzative possono avere un impatto sulla qualità della vita degli infermieri. Sebbene diversi studi abbiano indagato queste relazioni causali, nessuno di questi ha approfondito tali tematiche tra gli infermieri che lavorano nelle ambulanze. Obiettivi* *Esaminare quanto i fattori della salute organizzativa incidano sulla qualità della vita e sui disturbi psicosomatici degli infermieri che prestano servizio nelle ambulanze. Metodi:* *Il nostro campione è composto da 411 infermieri che lavorano nelle ambulanze dell'emergenza territoriale. Ai lavoratori sono stati somministrati due scale: una per misurare la salute organizzativa, l'altra per valutare la loro qualità di vita. Per esaminare le ipotesi sono state effettuate un'analisi descrittiva e una correlazionale. Conclusioni:* *Diverse dimensioni della salute organizzativa spiegano la qualità della vita e i disturbi psicosomatici degli infermieri che lavorano nell'emergenza. I risultati consentono di identificare possibili interventi su specifici aspetti dell'organizzazione che possono contribuire a migliorare la qualità della vita degli infermieri.*

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INTRODUCTION

Over the last few years several studies have investigated the organizational health in nurses' workplaces. Nurses' satisfaction and well-being are increasing being considered a priority (1, 7). In healthcare settings, health workers spend a considerable amount of physical and psychological energy. Work ought to give nurses satisfaction and possibilities for professional advancement, learning experiences and also put them in a position to prevent frustrations that may affect private life.

In our study, we focus on Organizational health, defined as the set of procedures and managerial practices aimed at providing healthcare to people via the nursing workforce. A healthy workplace should ensure and promote collaboration and integration among health professionals and enhance professional competence, skills and culture. This sort of workplace helps healthcare workers build up a sense of belonging both to their profession and to their organization, which in turn will create an environment where nurses see themselves as health promoters and feel motivated to pursue their professional mission (30). It has been widely acknowledged that the working environment and organizational health play a central role in causing stress and various syndromes and diseases which can affect the quality of life (QoL) of an individual (10, 37). Organizational health can affect QoL for several reasons. In particular, work is primarily the source of financial income for an individual, an inalienable activity allowing the start of a series of elective activities which can enrich a person's life, experiences and culture, such as cultivating one's interests, traveling and sports. Therefore, it is clear that the working environment, organizational practices and procedures and interpersonal relationships in the workplace can have a considerable effect on QoL. Moreover, when a job is appreciated, this also positively affects QoL (37).

It has been suggested that several health disorders can be due to the nature of work, organizational change and pressure at work (9). In the healthcare working environment, a poorer quality of patient care is the result of poor psychological

health and high levels of sickness absence (21, 35). Moreover the factors involved in QoL can affect work performance of healthcare workers (18).

Ellis and Pompili (12) used both qualitative and quantitative methods to examine QoL in nurses. The results showed that nurses considered the home-work interface, training opportunities, work stress, working conditions and career opportunities as important factors related to QoL. Another study highlighted the role of job demand, job control and social support in affecting QoL, well-being and stress in healthcare workers (28). Ergun (13) showed that emotional burden, high empathetic level, as well as the particular relationship between female nurses and patients suffering from cancer are factors which inevitably affect QoL of the staff. Also the hypothesis that the implementation of a modern organizational culture among nurses which positively affects their QoL contributes to tackling turnover, absenteeism, withdrawal and burnout was confirmed in our study (16, 35).

As noted by Hsu and Kernohan (17) it is important to carry out research in specific groups of healthcare workers to provide appropriate strategies that improve nurses' QoL. In our research, we examined how different organizational factors influenced the QoL and health of ambulance nurses working in prehospital emergency care. We also checked if there were any differences between males and females and older and younger nurses.

A review of the literature showed that none of these studies had investigated the link between organizational health, QoL and well-being in nurses employed in the prehospital emergency care.

The aims of our study were:

1. to measure organizational health and quality of life in ambulance nurses;
2. to investigate the impact of organizational health levels on both quality of life and psychosomatic complaints in males and females, and in older and younger nurses;
3. to investigate gender and age differences in both organizational health levels and quality of life factors.

METHOD

Design

A descriptive and correlational analysis was used.

Sample

The entire population consisting of 726 ambulance nurses working in prehospital emergency care of a Region in central Italy was invited to take part in our survey. Between January and March 2010, a questionnaire was administered to nurses working in different places across the provincial emergency structures. We explained to nurses the aim of our study and the method of data collection.

Data collection

Data were collected using a questionnaire assessing demographic variables, organizational health levels, quality of life and psychosomatic complaints.

Measurements

The *Nursing Organizational Health Questionnaire* (NOHQ) is a modified version of the Multidimensional Organizational Health Questionnaire adapted to the nursing context (5). Its final version consists of 8 Likert scales (from 1=Never to 4=Always) with 112 items. In particular, 6 scales measure the organizational health levels and 2 scales measure well-being indicators (31).

The scales of the NOHQ measuring organizational health are the following: the first scale measures *Workplace Comfort*; the second scale refers to the organizational context and the relational processes and measures six dimensions: *Perception of the coordinating staff*, *Perception of organization efficiency*, *Workers' perception of how they are appreciated*, *Perception of relationships with colleagues*, *Perception of conflict* and *Perception of organization efficacy*. The third scale regards *Openness to Innovation*. The fourth scale, which consists of a single factor, refers to the perception of *Work Safety and Accident Prevention*. The fifth scale refers to *Tolerability of tasks*

and measures two dimensions: *Work fatigue*, *Isolation and work routine*. The sixth scale measures *Stress*.

The scale measuring well-being indicators include: the four dimensions of the job satisfaction scale measurements: *negative indicators* (absenteeism, desire to change job, resentment towards employers, the perceived insignificance of employers, indifference to work, etc.), *positive indicators* (willingness to engage oneself in work, feeling part of a team, high level of participation, willingness to go to work, etc.), *satisfaction with top-management* and *satisfaction with one's department*. The last scale of the NOHQ measures *psychosomatic complaints*.

Quality of life was measured with SF-12 (36). This scale is derived from of the SF-36 and consists of 12 items. The scale measures two indices: *Physical Component Summary* (PCS) and *Mental Component Summary* (MCS), which respectively measure the levels of physical and psychological QoL. This scale is widely used internationally and its reliability and validity have also been tested in Italian studies (2).

Data analysis

The data were analyzed using the Statistical Package for Social Science (SPSS), version 15.0. The internal consistency of each dimension was investigated by using Cronbach's alpha and the item-total scale corrected correlations. After ascertaining reliability, dimensions were created by extracting factorial scores. Means and standard deviations were computed for all variables. In order to investigate gender and age differences, two-way ANOVAs were performed for each dimension. Moreover, to analyse the relationships between organizational health and workers' well-being in terms of psychosomatic complaints and the two factors of quality of life, three multiple regression analyses were performed. Specifically each multiple regression was carried out separately on males and females, as well as on the younger and older nurses. Thus, it is possible to investigate whether some dimensions had an effect on quality of life and on diseases only for female or male nurses and, similarly, only for younger or older workers. In these analyses the level of statistical significance was set at $p < 0.05$.

RESULTS

Respondents' demographics

The participants in this research were 411 ambulance nurses (response rate 57%). As shown in table 1, nearly 40% of the sample were females and more than 60% were males. The average age of the entire sample was slightly over 41 years, with a range between 24 and 59 years. With regard to education, nearly 80% had a general nursing degree and 20% had a university degree. Participants were also asked to indicate their complementary educational qualifications: just over 10% had a special-

ization certificate from Regional schools, 6.6% had a qualification certificate for managerial positions, 8.5% had a master's degree, 0.2% were qualified as head nurses, 1% had a degree in midwifery and nursing sciences and 0.7% had other kinds of degrees.

Regarding marital status, just over 20% were single and the remainder were married or cohabitated.

Just over one-third of the sample reported having two children, 27% one child, 26.3% no children, 10% three children and 1.2% more than four children. In relation to their professional position, more than 90% of the interviewees reported having

Table 1 - Respondents' demographics

	Mean	SD	Range	No. (%)
Gender				
Males				257 (62.5%)
Females				154 (37.5%)
Age				
Males	44.45	14.84	24-59	
Females	41.06	3.53	25-57	
Education				
General nursing degree				335 (78.8%)
University degree				90 (21.2%)
Complementary education				
Specialization certificate				53 (12.9%)
Managerial position certificate				27 (6.6%)
Master's degree				35 (8.5%)
Qualification as head nurse				1 (0.2%)
Specialist nursing degree				4 (1%)
Other degree				3 (0.7%)
Marital status				
Single				90 (21.9%)
Divorced				79 (17%)
Married or cohabitating				246 (59.9%)
Widowed				5 (1.2%)
Job experience				
Total years of work	18.82	8.50	0-40	
Years of work with current employer	9	16.11	0-30	
Average hours worked				
Daily	8.62	2.35	0-14	

a permanent contract with their employer. Just over 1% of the sample worked part-time and nearly all worked full-time.

Table 2 shows Cronbach's alpha reliabilities and item-total scale corrected correlations range for each dimension. All dimensions had a good internal coherence and all items had item-total scale corrected correlations >0.30 .

Tables 3 and table 4 show the means and standard deviations of the dimensions obtained in the factor analysis of the NOHQ scale and SF-12 scale separately for males and females and younger and older nurses. Workers were divided into two age groups: the younger group included those aged between 24 and 42 years (under the mean age of 42.4 years) and the older group included those aged between 43 and 59 years (over the mean age of 42.4 years).

Results from the two-way ANOVA showed significant gender and age differences on a number of assessed factors, whereas no interactions between gender and age were found. The degrees of freedom

for these F values were 1 and 411. Males had lower levels of MCS ($F=10.13$, $p<0.01$), PCS ($F=16.55$, $p<0.01$) and of the following QISO factors: *Perception of coordinating staff* ($F=8.52$, $p<0.01$), *Perception of organizational efficiency* ($F=8.16$, $p<0.01$) and *Perception of organizational efficacy* ($F=4.84$, $p<0.05$). Female nurses perceived lower levels of *negative indicators* ($F=5.93$, $p<0.05$) and *psychosomatic complaints* ($F=16.82$, $p<0.01$). There were no significant differences between female and male nurses in the following NOHQ factors: *workplace comfort*, *perception of relationships with colleagues*, *workers' perception of how they are appreciated*, *perception of conflict*, *work safety and accident prevention*, *isolation and work routine*, *work fatigue*, *stress*, *indicators of satisfaction with top-management*, *positive relationship indicators*, *indicators of satisfaction with one's department*, *inclination and openness to innovation*.

With regard to age difference, younger nurses had a better PCS ($F=10.91$, $p<0.01$). In relation to the analysis carried out with the NOHQ, they had lower levels of *stress* ($F=3.98$, $p<0.05$), *negative in-*

Table 2 - Reliability of the Organizational health dimensions and quality of life factors

	No. items	Cronbach's Alpha	Item-total scale correlation range
Organizational health dimensions			
Workplace Comfort	10	.92	.62-.76
Perception of coordinating staff	6	.86	.56-.72
Perception of organizational efficiency	8	.83	.50-.64
Perception of organizational efficacy	7	.76	.37-.59
Perception of relationships with colleagues	5	.71	.41-.58
Perception of staff advancement	4	.65	.30-.56
Perception of conflict	4	.58	.30-.46
Openness to Innovation	9	.92	.64-.80
Work Safety and Accident Prevention	8	.85	.34-.77
Work fatigue	5	.72	.42-.52
Stress	3	.54	.34-.38
Isolation and work routine	3	.59	.30-.57
Negative indicators	13	.90	.54-.68
Positive indicators	7	.86	.46-.74
Satisfaction with top-management	8	.85	.51-.69
Satisfaction with department	3	.76	.49-.66
Psychosomatic diseases	8	.85	.31-.72
Quality of life factors			
Physical Component Summary	6	.64	.32-.49
Mental Component Summary	6	.78	.48-.65

Table 3 - Organizational health dimensions and quality of life factors, separately for males and females

	Females		Males	
	Mean	SD	Mean	SD
Quality of life factors				
Mental Component Summary *	-0.186	0.919	0.111	0.903
Physical Component Summary *	-0.193	0.931	0.116	0.823
Organizational health dimensions				
Workplace Comfort	0.030	0.963	-0.018	0.965
Perception of coordinating staff*	-0.182	0.879	0.109	0.974
Perception of organizational efficiency*	-0.175	0.868	0.105	0.948
Perception of organizational efficacy**	-0.125	0.818	0.075	0.948
Perception of relationships with colleagues	-0.086	0.873	0.052	0.910
Perception of staff advancement	-0.059	0.812	0.035	0.929
Perception of conflict	0.062	0.790	-0.037	0.874
Work Safety and Accident Prevention	-0.029	0.907	0.018	0.969
Isolation and work routine	-0.001	0.972	0.000	1.006
Work fatigue	0.037	0.772	-0.022	0.912
Stress	0.000	0.775	0.000	0.846
Negative indicators **	0.126	1.000	-0.076	0.928
Satisfaction with top-management	-0.106	0.948	0.064	0.947
Positive indicators	-0.014	0.896	0.008	0.955
Satisfaction with department	0.003	0.826	-0.002	0.939
Psychosomatic diseases*	0.215	0.901	-0.129	0.929
Openness to Innovation	-0.096	0.826	0.058	1.035

* p for two-way ANOVA < 0.01

** p for two-way ANOVA < 0.05

dicators ($F=4.29$, $p<0.05$), *psychosomatic complaints* ($F=7.31$, $p<0.01$) and *perception of conflict* ($F=5.80$, $p<0.05$). There were no significant differences between younger and older nurses in relation to MCS and the NOHQ dimensions: *comfort of the workplace*, *perception of coordinating staff*, *perception of organizational efficacy*, *perception of relationships with colleagues*, *development of work skills*, *work safety and accident prevention*, *isolation and work routine*, *work fatigue*, *indicators of satisfaction with top-management*, *positive indicators*, *indicators of satisfaction with one's department*, *inclination and openness to innovation*.

Multiple regression analysis

Results of the regressions showed that the dimensions of organizational health accounted for a part of the variance of the PCS, the MCS and the *psychoso-*

matic complaints. Particularly, with regard to the regressions on the male sample, the results showed that the dimensions of the NOHQ accounted for 20.2% for the MCS, 17.1% for the PCS and 38.7% for the *psychosomatic complaints*. With regard to the female sample, the dimensions of the NOHQ accounted for 29.9% of the MCS, 30.9% of the PCS and 45.0% of the *psychosomatic complaints*.

Lastly, in the group of older workers the results showed that the dimensions of the NOHQ accounted for 36.4% of the MCS, 28.8% of the PCS and 43.9% of the *psychosomatic complaints*. Tables 5, 6 and 7 showed the regression coefficients separately for males, females, younger and older workers.

As shown in Table 5, *perception of organizational efficiency* had a positive significant effect on MCS only for males, that is, the higher the perception of *organizational efficiency* the higher the level of mental health. *Perception of organizational efficacy*

Table 4 - Organizational health dimensions and quality of life factors, separately for younger and older nurses

	Younger (24-42 yrs)		Older (43-59 yrs)	
	Mean	SD	Mean	SD
Quality of life factors				
Mental Component Summary	-0.013	0.976	0.012	0.863
Physical Component Summary *	0.115	0.712	-0.110	0.999
Organizational health dimensions				
Workplace Comfort	-0.025	0.930	0.024	0.996
Perception of coordinating staff	-0.068	0.949	0.065	0.946
Perception of organizational efficiency	-0.051	0.909	0.049	0.944
Perception of organizational efficacy	-0.015	0.893	0.014	0.920
Perception of relationships with colleagues	-0.072	0.852	0.069	0.936
Perception of staff advancement	-0.014	0.769	0.013	0.989
Perception of conflict**	-0.080	0.835	0.077	0.848
Work Safety and Accident Prevention	-0.048	0.925	0.046	0.964
Isolation and working routine	-0.046	1.026	0.044	0.959
Work fatigue	-0.067	0.888	0.064	0.833
Stress**	-0.083	0.801	0.080	0.830
Negative indicators **	-0.068	0.899	0.065	1.011
Satisfaction with top-management	-0.016	0.901	0.016	0.997
Positive indicators	-0.003	0.869	0.003	0.992
Satisfaction with department	0.045	0.894	-0.043	0.900
Psychosomatic diseases*	-0.098	0.912	0.094	0.944
Openness to Innovation	0.011	0.890	-0.011	1.032

* p for two way ANOVA<0.01

**p for two way ANOVA<0.05

had a positive and significant effect on MCS only for the younger workers; that is, the higher the perception of *organizational efficacy* the higher the levels of mental health. The *perception of relationships with colleagues* and the *indicators of satisfaction with one's department* had a positive significant effect on MCS only on the older workers; mainly, a better perception of working relationships with colleagues as well as satisfaction with one's department favoured a higher level of mental health. The perception of work *safety and accident prevention* significantly affected MCS for both the younger and the male workers; in particular, the safer the working environment was perceived, the greater was the feeling that employers made every effort in terms of accident prevention and the higher the level of mental health of the sample. However, among the older and the female nurses, *work fatigue* had a significant negative effect on MCS: the harder the

work, the lower the level of mental health. *Negative indicators* significantly affected MCS in both the older and the male workers: with a more negative perception of one's work the level of mental health was lower. On the other hand, a positive perception of work had a significant effect on MCS both for the younger and for the female nurses: the more the perception of one's work was positive, the higher the level of workers' mental health.

As shown in Table 6, with regard to regressions on physical health, the perception of *Workplace Comfort* affected PCS significantly only for female nurses; in particular, higher levels of *workplace comfort* facilitated higher levels of physical health. However, the factors *perception of relationships with colleagues*, *perception of organizational efficacy*, *workers' perception of how they are appreciated* had a significant effect only on the older workers. In particular, a better perception of these organizational

Table 5 - Regression analysis of Organizational health dimensions on Mental Component Summary, by gender and age

Mental Component Summary	Younger		Older		Males		Females	
	Beta	p	Beta	P	Beta	p	Beta	p
Workplace Comfort	-0.077	0.483	-0.099	0.197	-0.153	0.062	0.147	0.145
Perception of coordinating staff	-0.109	0.352	-0.111	0.253	0.123	0.392	0.051	0.695
Perception of organizational efficiency	0.108	0.398	0.107	0.362	0.283	0.013	-0.125	0.393
Perception of organizational efficacy	0.283	0.006	-0.124	0.181	0.083	0.369	0.035	0.726
Perception of relationships with colleagues	0.004	0.966	0.241	0.009	0.059	0.504	0.186	0.104
Perception of staff advancement	-0.125	0.203	0.012	0.894	-0.042	0.632	-0.059	0.607
Perception of conflict	0.061	0.435	0.013	0.856	0.000	0.999	0.027	0.768
Work Safety and Accident Prevention	0.236	0.038	-0.020	0.805	0.198	0.015	-0.036	0.734
Isolation and work routine	0.156	0.121	0.000	0.998	0.060	0.474	0.093	0.395
Work fatigue	-0.040	0.710	-0.264	0.004	-0.044	0.649	-0.246	0.018
Stress	-0.107	0.363	-0.173	0.103	-0.132	0.203	-0.126	0.323
Negative indicators	-0.125	0.136	-0.176	0.014	-0.202	0.006	-0.065	0.496
Satisfaction with top-management	-0.095	0.353	0.016	0.873	-0.031	0.763	-0.025	0.818
Positive indicators	0.215	0.031	0.163	0.096	0.178	0.072	0.348	0.001
Satisfaction with department	-0.136	0.123	0.175	0.037	0.021	0.793	0.009	0.930
Openness to Innovation	-0.070	0.501	0.107	0.209	-0.056	0.529	-0.001	0.989

Table 6 - Regression analysis of Organizational health dimensions on Physical Component Summary, by gender and age

Physical Component Summary	Younger		Older		Males		Females	
	Beta	p	Beta	P	Beta	p	Beta	p
Workplace Comfort	0.035	0.749	0.046	0.568	-0.015	0.855	0.246	0.015
Perception of coordinating staff	0.115	0.333	-0.059	0.564	-0.130	0.187	0.177	0.170
Perception of organizational efficiency	0.289	0.027	-0.113	0.363	0.255	0.029	0.329	0.025
Perception of organizational efficacy	0.066	0.528	-0.196	0.046	-0.028	0.767	-0.104	0.302
Perception of relationships with colleagues	-0.035	0.736	0.286	0.003	0.068	0.449	0.187	0.101
Perception of staff advancement	-0.134	0.179	0.225	0.023	0.059	0.509	0.116	0.309
Perception of conflict	0.025	0.754	-0.038	0.613	-0.039	0.577	0.001	0.988
Work Safety and Accident Prevention	0.109	0.342	-0.107	0.215	-0.099	0.228	-0.019	0.855
Isolation and work routine	-0.096	0.347	0.012	0.891	-0.024	0.779	-0.046	0.671
Work fatigue	-0.031	0.775	-0.056	0.560	-0.001	0.993	-0.051	0.617
Stress	-0.109	0.364	-0.334	0.003	-0.288	0.007	-0.197	0.121
Negative indicators	-0.076	0.376	-0.145	0.055	-0.129	0.084	-0.131	0.165
Satisfaction with top-management	-0.109	0.296	-0.038	0.718	-0.096	0.363	-0.009	0.935
Positive indicators	0.174	0.086	0.257	0.014	0.283	0.005	0.222	0.034
Satisfaction with department	0.049	0.584	0.092	0.297	0.085	0.293	0.096	0.336
Openness to Innovation	-0.269	0.012	-0.026	0.771	-0.152	0.092	-0.087	0.418

factors facilitated a higher level of mental health. *Stress* significantly affected only older and male workers: the higher the level of *stress*, the lower the level of physical health. Finally, a positive perception of one's work had a considerable effect on all groups except the younger nurses; in particular,

physical health improved when there was a higher level of *positive indicators*.

As shown in Table 7, with regard to *psychosomatic complaints*, *perception of cooperation with colleagues* significantly affected only the older workers. A better perception of relationships with colleagues pre-

Table 7 - Regression analysis of Organizational health dimensions on Psychosomatic complaints, by gender and age

Psychosomatic complaints	Younger		Older		Males		Females	
	Beta	p	Beta	P	Beta	p	Beta	p
Workplace Comfort	-0.049	0.608	0.109	0.128	0.101	0.161	-0.165	0.065
Perception of coordinating staff	-0.027	0.794	-0.020	0.822	-0.001	0.990	-0.062	0.592
Perception of organizational efficiency	-0.123	0.267	0.073	0.507	-0.166	0.096	0.137	0.070
Perception of organizational efficacy	-0.077	0.390	0.135	0.083	0.105	0.194	-0.022	0.809
Perception of relationships with colleagues	0.110	0.220	-0.287	0.001	-0.031	0.683	-0.108	0.288
Perception of staff advancement	0.051	0.551	-0.019	0.828	0.004	0.961	-0.121	0.236
Perception of conflict	0.176	0.011	0.088	0.185	0.121	0.043	0.108	0.181
Work Safety and Accident Prevention	-0.091	0.354	0.072	0.347	-0.031	0.665	0.133	0.159
Isolation and work routine	0.079	0.368	-0.097	0.218	-0.042	0.573	0.058	0.547
Work fatigue	0.260	0.006	0.142	0.099	0.161	0.056	0.284	0.002
Stress	0.132	0.199	0.341	0.001	0.227	0.013	0.160	0.158
Negative indicators	0.198	0.007	0.366	0.000	0.417	0.000	0.219	0.010
Satisfaction with top-management	0.107	0.091	-0.058	0.537	0.139	0.089	0.016	0.863
Positive indicators	-0.258	0.003	-0.084	0.358	-0.210	0.016	-0.202	0.030
Satisfaction with department	0.076	0.322	-0.020	0.799	-0.071	0.304	0.099	0.265
Openness to Innovation	0.053	0.560	-0.021	0.790	0.054	0.487	-0.057	0.551

vented the onset of diseases. *Perception of conflict* had a significant effect on diseases in the younger and male nurses; in particular, the higher the level of conflict perceived, the higher the level of psychosomatic complaints. *Work fatigue* significantly affected the younger and female workers; specifically, the greater the level of *work fatigue*, the higher the level of psychosomatic complaints. *Stress* had a significant effect only on the older and male workers; thus, higher levels of stress corresponded to higher rates of poor health. A negative perception of work significantly affected all groups; specifically, in the individual's professional environment a higher number of *negative indicators* increased the rate of psychophysical diseases. Lastly, a positive perception of work had a considerable effect on all groups, except on the older nurses; the greater the number of *positive indicators*, the fewer the diseases.

DISCUSSION

This study was the first to examine the relationship between organizational health and QoL in a sample of ambulance nurses working in prehospital emergency care. On the whole, females were seen

to have better mental and physical health and perception of the coordinating staff, also in terms of organizational efficacy and efficiency. To a large extent, males were more prone to psychosomatic complaints and to phenomena referable to the presence of negative indicators. Better physical health and less stress and psychosomatic complaints were found among the younger nurses, who reported less negative indicators and interpersonal conflict in their professional context. The involvement of nurses in organizational procedures proved to be a crucial issue.

Some studies focused on the turnover of nursing staff working in Intensive Care Units (22, 33, 34), demonstrating that nurses were reluctant to work in Intensive Care Units, mainly because of their inadequate involvement in the organizational procedures. The whole sample presented low QoL levels, compared to both national and international standards (19). A study conducted on 61,434 healthy Italian subjects showed that the average PCS and the MCS scores were 50.03 and 50.07 respectively. These scores were slightly lower in female nurses compared to male nurses. Moreover, the average discrepancy between PCS and MCS was 0.5% in both male and female nurses (25). The

same study showed that the PCS scores were higher by 3.2 compared to the MCS and that the male workers' quality of life was significantly better than that of the female nurses.

In this study, multiple regression was carried out separately according to gender and age, highlighting some interesting relationships between the same dimensions of organizational health, psychosomatic diseases and the two QoL dimensions in ambulance nurses. The physical health of the female nurses was affected by the comfort of the professional environment, whereas their mental health was closely linked to work fatigue and to the presence of positive indicators in their organizational context. In female nurses, a greater workload corresponded to lower mental health levels. Their mental health was correlated with the quality of the professional climate, such as the feeling of being part of a team, high levels of involvement and engagement. Consequently, the study showed that the presence of negative indicators affected their psychosomatic conditions. Phenomena such as the desire to change job, resentment towards employers and perceived insignificance of the same, as well as indifference towards one's work, favoured the onset of diseases. However, in men the research showed that interpersonal conflicts and work-related stress accounted for the onset of psychosomatic diseases. In fact, a survey conducted on 698 workers found that episodes of anxiety and depression, considered as an expression of mental health, were directly proportional to the increase in stress factors. However, the latter proved to be inversely proportional to physical health (8). Moreover, the study demonstrated that mental health in male nurses was proportionally affected by organizational efficiency and by appropriate procedures regarding work safety and accident prevention in their professional context. Their mental health was negatively correlated with the presence of negative indicators in the same context. With regard to younger nurses, this survey showed that organizational efficiency and openness to innovation affected their physical health. Moreover, their mental health was found to be affected by organizational efficacy, positive indicators and the perception of being in a safe workplace. As reported in the literature, older nurses

generally suffered less from dissatisfaction at work because they had a well-established professional independence and had no intention of changing their job (11). Our study showed that the physical health of older nurses improved with higher levels of organizational efficacy, workers' perception of how they are appreciated, and a positive perception of their workplace. Their physical health and psychosomatic complaints were also affected by stress and negative indicators and better interpersonal relationships. Moreover, their mental health was directly proportional to the quality of interpersonal relationships established with colleagues, satisfaction with one's department, work fatigue and the presence of negative indicators.

Another study on health staff, including nurses (24), found that there was a correlation between *non-handling of interpersonal conflicts by managers* and the beginning of an emotional breakdown. This survey, as well as other studies (6, 15), showed that dissatisfaction at work was a negative index for the onset of the burn-out syndrome. Lastly, the whole sample highlighted the connection between the presence of negative indicators in the professional context and the onset of psychophysical diseases. A better organizational efficiency improved the physical health of all healthcare workers, except male workers. From this point of view, the style of leadership practised by coordinating staff and nursing managers played a fundamental role. The literature widely demonstrates that adequate leadership can favour better satisfaction at work among the nursing staff, which inevitably affects the quality of treatment (4, 26, 29). Transformational leadership proved to be the mostly correlated to high levels of work satisfaction (14).

Our research showed that the QoL of nurses working in prehospital emergency care was correlated to organizational health aspects. Perceived efficiency and efficacy, openness to innovation, workplace comfort and safety, relationships between colleagues and coordinating staff, appreciation of workers and perceived work overload were the core elements of intervention for the promotion of well-being and health in the working environment.

Indeed, it is advisable to focus on the policies that will promote organizational health. This can

give workers the opportunity to participate actively in work dynamics. Obviously, in order to have a response in terms of quality, the expectations of nurses' professional life have to be met. This is fundamental for a reduction in work-related stress, which affects nurses QoL (17). "Appropriate" staff management involves investing in culture, training and human emotions, but also keeping costs low. Workers, who are appreciated and understood, tend to "fall ill" less, are less subject to stress and are more motivated to work (23, 27, 32). In this sort of context, the type of managerial nursing culture plays an important role: here the usual organizational rules must be implemented and attention must be paid to aspects of the specific professional role, such as the social value, which aims at guaranteeing the inalienable right to health. It is necessary to humanize nurses' work and transform the metaphor of the "administrative machine" into one of "human thought and emotions", in order to create public values, improve services and offer citizens more qualified care (20).

The findings of this study should be interpreted in the light of its limitations. A clear limitation of this research lies in its cross-sectional nature. A longitudinal or experimental design may further confirm our findings. Another limit of our research is in its one-method design used for data collection: objective indicators of organizational context may in fact be added to enhance the generalizability of self-reporting-based results. Furthermore, one potential problem in our analysis was in the large number of comparisons we tested. In particular, some of the significant results may depend on capitalizing on chance. However, also after Bonferroni correction more than the 90% of the effects remained significant. A final possible limit that undermines the validity of this research consists in a possible specification error due to not having included some important variables related to quality of life and psychosomatic complaints, such as burnout, personality variables such as anxiety trait, and variables relating to control and coping.

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