

Monalisa de Cássia Fogaça¹,
Werther Brunow de Carvalho²,
Paulo Cesar Koch Nogueira³, Luiz
Antonio Nogueira Martins⁴

Occupational stress and repercussions on the quality of life of pediatric and neonatal intensivists physicians and nurses

Estresse ocupacional e suas repercussões na qualidade de vida de médicos e enfermeiros intensivistas pediátricos e neonatais

1. Psychologist Universidade Metodista de São Paulo and a PhD from the Psychiatry Department, Universidade Federal de São Paulo – UNIFESP – São Paulo (SP), Brazil.

2. Adjunct Professor, Pediatrics Department, Universidade Federal de São Paulo – UNIFESP – São Paulo (SP), Brazil.

3. Adjunct Professor, Pediatrics Department, Universidade Federal de São Paulo – UNIFESP – São Paulo (SP), Brazil.

4. Adjunct Professor, Psychiatry Department, Universidade Federal de São Paulo – UNIFESP – São Paulo (SP), Brazil.

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Author for Correspondence:

Werther Brunow de Carvalho
Universidade Federal de São Paulo /
Escola Paulista de Medicina
Departamento de Pediatria
Rua Botucatu, 598 - Vila Clementino
CEP: 04023-062 - São Paulo (SP),
Brazil.

Phone/Fax: 55 (11) 3081-9877

E-mail: wertherbru.dpded@epm.br;

monalisa.cassia@uol.com.br

ABSTRACT

Objective: To investigate the relationship between work and quality of life of doctors and nurses in pediatric intensive care units and neonatal.

Methods: Cross-sectional study with 37 doctors and 20 nurses. The Job Content Questionnaire (JCQ) e Effort-Reward Imbalance (ERI), and World Health Organization Quality of Life (WHOQOL-100) were used. The correlation was estimated by Spearman correlation coefficient.

Results: The effort is inversely correlated with the areas physical, psychological, level of independence, environment ($p < 0.01$) and social relationship ($p < 0.05$). The reward is inversely correlated with the areas and psychological ($p < 0.05$) level of independence ($p < 0.01$). Control over the work is directly correlated with the physical

domain ($p < 0.05$). The psychological demands are inversely correlated with the areas physical ($p < 0.05$), psychological ($p < 0.01$) and level of independence ($p < 0.01$). The physical demand is inversely correlated with physical areas, level of independence, environmental ($p < 0.01$) and psychological ($p < 0.05$). Job insecurity is inversely correlated with the psychological fields, level of independence ($p < 0.05$) and the environment ($p < 0.01$). Support the supervisor is directly correlated with degree of independence ($p < 0.05$).

Conclusion: Doctors and nurses showed high efforts, demands psychological, physical and job insecurity that impact on quality of life.

Keywords: Intensive care units, pediatric/manpower; Burnout, professional; Quality of life; Job satisfaction; Questionnaires

INTRODUCTION

The concept of quality of life has been used in the fields of health and of work to verify indicators found in a series of social contexts that might undergo interventions through health policies or business management strategies.⁽¹⁾

Quality of life at work (QLW), has been a concern of man since the beginning of his existence. Under other titles, in other contexts, but it is always directed towards facilitating or giving satisfaction and well being to workers in the performance of their job.⁽²⁾

For Lacaz⁽³⁾ there are different definitions for QLW, sometimes associating them to characteristics intrinsic to the technologies introduced and their impact, sometimes to economic aspects such as salaries, incentives or even connected to physical, mental and safety factors and the overall well being of workers.

In view of this, it is advocated that of the aspects explaining the definition and implementation of quality (of life) work, is the control – encompassing the autonomy and power the worker has over the working processes, and the reward – which is the crucial link between self-regulating functions as self-esteem and self-efficacy and the framework of social opportunity.⁽⁴⁾

One of the situations of physical and mental wear for healthcare workers is the accumulation of two or more jobs, causing an excessive work load.^(5,6)

In the setting of intensive care units (ICU) the process of physical and mental wear, resulting from work overload, may cause stress, harming the working conditions and the organizational relationships.

In view of this, some studies⁽⁷⁻¹³⁾ show the outcomes of organizational aspects on the physical and mental health of physicians and nurses working in pediatric and neonatal ICU such as: burnout, psychological changes generating professional stress, alteration of salivary cortisol and amylase due to excessive noise, difficulties of team relationships with family members and patients. Two recent Brazilian studies that assessed intensivists nurses and physicians are also noteworthy.^(14,15) They show that stress in the occupational environment brought about job dissatisfaction, affected physical health, shift of personnel, absenteeism and the state of the art technology in these units, in addition to high prevalence of physicians burnout.

Thus, considering that the job is one of the factors that may influence the quality of life of pediatric and neonatal intensivist physicians and nurses, the purpose of this study was to investigate relationships in work conditions using the Job Content Questionnaire (JCQ) and Effort-Reward Imbalance (ERI), and their effect on the quality of life (World Health Organization Quality of Life -WHOQOL-100).

METHODS

A cross sectional study including physicians and nurses, who worked in the Pediatric (35) and Neonatal (22) ICU of the Universidade Federal de São Paulo/ Escola Paulista de Medicina (UNIFESP/EPM) was carried out. A total of 25 physicians and 10 nurses of the Pediatric ICU and 12 physicians and 10 nurses of the Neonatal ICU were assessed, constituting the total sample of 57 professionals who accepted to spontaneously participate in the study. Inclusion criterion was

to be physician or nurse hired to work in the ICU and resident physicians in clerkship at the ICU. Distribution of sample loss is in table 1. That completed questionnaires that were not returned caused this sample loss (50%).

Table 1 – Number of professionals in the intensive care unit invited to participate in the study

	Physicians		Nurses	
	Accepted	Did not accept	Accepted	Did not accept
Pediatric ICU	25	26	10	1
Neonatal ICU	12	28	10	4
Total	37	54	20	5

ICU – Intensive care unit

Research protocol was approved by the Research Ethics Committee UNIFESP/EPM (nº 1604/04) and all participants signed a term of informed consent.

Participants replied to the Brazilian version of ERI, JCQ and WHOQOL-100. The intensive care units studied presented the following characteristics when the assessment tools were applied (2005):

Pediatric Unit:

Reference: cardiac surgery – congenital heart disease, neurosurgery, orthopedic surgery and liver transplantation.

Number of beds: 09

Medical staff comprised:

- 02 head physicians on day duty (total of 10 physicians)

- 01 day worker

- 02 physician on night duty, alternating every 15 days (total of 10 physicians)

- 01 residency coordinator, specialization and graduation

- 01 head of the PICU

Hourly load of the physician team:

- 20h/week: 12h in care and 8 hours in scientific production

Residents

- 09 Residents

- Hourly load: 60 h/week

Nurses

- 5 nurses (1 in charge, 2 morning, 1 afternoon, 1 night: on duty)

- 7 hours work daily, hired by Hospital São Paulo

- 6 hours work daily as employees of the Universidade Federal de São Paulo

Neonatal Unit

Number of beds: 20

Age: premature and newborn

Medical staff comprised

- Teachers: 6

- Assistants: 14

- 4th year trainees: 6

- 3rd year trainees: 7

- On duty: 13

- Medical staff hourly load

- Teacher – 40h/week

- Assistants either 20h or 40h/week

On duty – 12hours

Nurses

13 nurses (3 morning, 3 afternoon, 6 nightly, 1 nurse from Continued Education)

Hourly load: those in charge work 7 hours, the others work 6 hours and a 12/36 for night shifts.

Effort-Reward Imbalance (ERI)

Translated and adapted by Liliana Andolpho Guimarães (UNICAMP),⁽⁴⁾ is applicable to a large variety of occupational scenarios. It describes situations where there is lack of reciprocity between effort and reward on the job, for instance high effort/low reward conditions, that cause ongoing reactions at emotional and physiological levels.

For Siegrist⁽¹⁶⁾ there are two sources of effort: extrinsic (job requirements) and intrinsic (individual motivations of the worker facing requirements), the latter follow the same concept (“need of control” defined as a standard to deal with job requirements and that has two variables: *vigor* and *immersion*. Vigor is defined as active effort, with high probability of reward (positive feedback) and immersion as a state of exhaustive competition.

The instrument is comprised by 46 items, divided into three parts: effort (6 items) reward (11 items) and over-commitment (6 items on need for approval, 6 items on competitiveness, 8 items on irritability and 9 items on difficulty to disconnect from the job environment). Response measure for each item is ranked in 4 levels (1= does not bother me; 2 = bothers me a little; 3 = bothers me a lot and 4= bothers me very much ; or 1 = I do not agree at all; 2 = I do not agree; 3= I agree and 4= I fully agree). Cronbach’s alpha value for extrinsic effort is 0.68, for job reward is 0.78 and for over-commitment 0.78.⁽¹⁷⁾ Balance between effort and reward is given by the index $(\Sigma E \div [\Sigma R \times c])$, where E = extrinsic effort and R= reward multiplied by the correction factor (c=0.545455). As a result, the values lower or equal to 1, indicate balance

between effort and reward, while values higher than 1 indicate imbalance condition between effort and reward. In relation to the over-commitment scale a value over 19 points is indicative of a higher risk of developing occupational stress.

Job Content Questionnaire (JCQ)

Prepared by Robert Karasek*, is comprised by 49 issues queries.

The variables analyzed were: control over the job (authority to decide and decision authority at macro level) psychological demands of the job, physical effort; physical isometric load; physical demands of the work; job insecurity; social support from supervisor; social support from colleagues. The response measure for each item is ranked in 4 levels: 1= I strongly disagree, 2 = I disagree, 3= I agree and 4= I strongly agree. Cronbach’s alpha coefficient generally accepted for women is 0.73 and for men = 0.74.⁽¹⁸⁾

World Health Organization Quality of Life (WHOQOL-100)

Instrument used to assess the quality of life. It is based upon the assumption that quality of life is a subjective set (perception of the individual in question), multidimensional and comprised by positive (i.e. mobility) and negative (i.e. pain) dimensions.

The WHOQOL Portuguese version was developed in the WHOQOL Center for Brazil, in the psychiatry and forensic sciences department of the Universidade Federal do Rio Grande do Sul, under coordination of Professor Marcelo Pio de Almeida Fleck PhD.

It comprises one hundred queries covering six domains: physical (I), psychological (II), level of independence (III), social relationship (IV), environment (V) and spirituality/religiousness/personal beliefs (VI). These domains are divided in 24 features. Each feature comprises four questions.

Replies to the WHOQOL questions are given in a Likert type scale. Questions are replied by four types of scales: intensity (nothing – extremely), capacity (nothing – completely), frequency (never – always) and assessment (very dissatisfied, very satisfied, very bad, and very good). The score for each domain may be transformed into a scale ranging from 0 to 100, with zero the worst and 100 the best result.⁽¹⁹⁾

Mean and other central tendency measures of the variations that comprise the instruments ERI, JCQ and WHOQOL-100 were calculated. Associations were measured by the Spearman correlation coefficient.

RESULTS

Physicians were predominantly female (76%) with a mean age 34.70 ± 7.11 years and had on the average worked in the ICU for 7.17 ± 6.89 years. Nurses were mostly female (95%), with a mean age of 31.55 ± 6.37

years and had on the average worked in the ICU for 5.85 ± 4.40 years.

In the ERI analysis, mean values found for effort and reward were 8.07 ± 2.7 and 13.46 ± 2.89 , respectively. In JCQ mean values for the variables were: control over the job – 34.04 ± 6.37 ; psychological demand of work – 34.32 ± 5.40 ; physical effort – 6.56 ± 1.50 ; physical isometric load – 4.88 ± 1.19 ; physical demand of work – 11.44 ± 2.09 ; job insecurity – 5.77 ± 2.25 ; support by supervisor – 11.67 ± 5.65 and support by colleagues – 11.54 ± 1.09 . Mean values found in the domains that comprise WHOQOL-100 were: physical- 13.45 ± 2.68 ; psychological – 13.91 ± 2.41 ; level of independence – 15.90 ± 2.67 ; social relationship – 14.73 ± 2.84 ; environment- 13.15 ± 1.97 and spirituality/religiousness/personal beliefs (16.14 ± 2.80) (Table 2).

The ERI, JCQ and WHOQOL correlation assessed by the Spearman correlation coefficient was significant in some variables of the respective questionnaires (Tables 3 and 4).

ERI: Effort is inversely correlated with the physical ($r = -0.57$, $p < 0.01$); psychological ($r = -0.54$, $p < 0.01$); independence level ($r = -0.64$, $p < 0.01$); social relationship ($r = -0.32$, $p < 0.05$) and environment ($r = -0.44$, $p < 0.01$) domains. Reward is inversely correlated with the psychological ($r = -0.32$, $p < 0.05$) and independence level ($r = -0.40$, $p < 0.01$) domains.

JCQ: Control over job is directly correlated with the physical ($r=0.29$, $p<0.05$). Psychological demand of work is inversely correlated with the physical ($r = -0.31$, $p < 0.05$); psychological ($r = -0.36$, $p < 0.01$) and independence level ($r = -0.30$, $p < 0.05$) domains. Physical

Table 2 – Descriptive analysis

Variables	Results	SD
ERI		
Effort	8.07 ± 2.70	2.7
Reward	13.4 ± 2.89	2.89
JCQ		
Job control	34.04 ± 6.37	6.37
Psychological demand of work	34.32 ± 5.40	5.40
Physical effort	6.56 ± 1.50	1.50
Physical isometric load	4.88 ± 1.19	1.19
Physical demand of work	11.44 ± 2.09	2.09
Job insecurity	5.77 ± 2.25	2.25
Support by supervisor	11.67 ± 5.65	5.65
Support by colleagues		
WHOQOL-100		
Physical	13.45 ± 2.68	2.68
Psychological	13.91 ± 2.41	2.41
Independence level	15.90 ± 2.67	2.67
Social relationship	14.73 ± 2.84	2.84
Environment	13.15 ± 1.97	1.97
Spirituality/personal beliefs/religiousness	16.14 ± 2.80	2.80

ERI - Effort Reward Imbalance; JCQ – Job Content Questionnaire; WHOQOL-100 - World Health Organization Quality of Life ; Results expressed in mean \pm standard deviation

Table 3 - Spearman correlation coefficient with variables of the Job Content Questionnaire - JCQ

	DOM 1	DOM 2	DOM 3	DOM 4	DOM 5	DOM 6
Job control	0.295*	0.243	0.249	0.038	0.212	0.020
Psychological job demand	-0.316*	-0.366**	-0.302*	-0.237	-0.131	0.000
Physical effort	-0.189	-0.125	-0.217	-0.159	-0.195	0.500
Physical isometric load	-0.395**	-0.332*	-0.358**	-0.150	-0.355*	0.047
Physical job demand	-0.392**	-0.307*	-0.382**	-0.227	-0.354**	0.061
Physical job insecurity	-0.251	-0.331*	-0.312*	-0.217	-0.461**	-0.122
Social support by supervisor	0.118	0.065	0.285*	0.150	0.062	-0.167
Support by colleagues	0.031	0.190	0.022	0.206	0.241	0.216

* $p < 0.05$; ** $p < 0.01$; DOM - domain

Table 4 - Spearman correlation coefficient with the variables effort and reward of the Effort Reward Imbalance - ERI

	DOM 1	DOM 2	DOM 3	DOM 4	DOM 5	DOM 6
Effort	-0.571**	-0.544**	-0.641**	-0.322*	-0.448**	-0.119
Reward	-0.253	-0.327*	-0.406**	-0.161	-0.234	-0.118

* $p < 0.05$; ** $p < 0.01$; DOM - domain

demand at work is inversely correlated with the physical ($r = -0.39$, $p < 0.01$); psychological ($r = -0.30$, $p < 0.05$); independence level ($r = -0.38$, $p < 0.01$) and environment ($r = -0.35$, $p < 0.01$) domains. Job insecurity is inversely correlated with the psychological ($r = -0.33$, $p < 0.05$); independence level ($r = -0.31$, $p < 0.05$) and environment ($r = -0.46$, $p < 0.01$) domains. Support by supervisor is directly correlated with independence level ($r = 0.28$, $p < 0.05$).

DISCUSSION

Association between occupational stress and quality of life of the worker has been assessed in different studies.⁽²⁰⁻²⁴⁾

Quality of life at work of healthcare professionals, mainly nursing, has been highlighted in current literature,⁽²⁵⁻²⁷⁾ showing that physical and psychological health are somewhat impaired: chronic pain, dissatisfaction with sleep, medication dependence and depression among others, when assessed by WHOQOL-BREF and SF-36. In the population assessed we observed that effort on the job, interferes negatively in relation to the physical, psychological and level of independence domains in the subjects assessed using the WHOQOL-100.

The study by Stansfeld⁽²¹⁾ shows that stress at work, lack of reward and high demands have an impact on the worker's quality of life. Men and women who participated in the Stansfeld study presented with physical and mental health problems due to the poor control over work and lack of support by supervisor. In our study psychological as well as demand at work had a negative effect on the domains assessed using WHOQOL-100. The variable job insecurity also presented a negative correlation in relation to the psychological, level of independence and environment domains.

In literature we found correlation studies⁽²⁰⁻²⁴⁾ between JCQ, ERI and some instrument to assess quality of life (WHOQOL, SF-36, SF-12), that substantiate our data, showing that less job control, great psychological demands and poor social support have an impact on the worker's quality of life.

We observed that support by the supervisor is correlated to a higher level of independence I which was also acknowledged by Probst,⁽²⁴⁾ who verified that professionals who participate in decisions tend to a lower turnover and less indifference in behavior.

Recent studies by Rusli⁽²⁸⁾ and LaMontagne,⁽²⁹⁾ showed that great demand at work is directly related to

stress and that women present higher prevalence of stress at work and depression.

Although no comparison between genders was carried out for level of tension and quality of life at work, the studied population was mostly of the female gender and in a certain way studies mentioned above may serve as reference for comparison of our sample.

Study limitations

This study makes a descriptive outline, with frequency survey carried out in a single center and with a small sample. Fifty percent of the sample did not return the questionnaires which may have jeopardized results.

CONCLUSIONS

Relationships between work conditions and quality of life of intensivists pediatric and neonatal physicians and nurses assessed in this study are impaired. Physicians as well as nurses present high efforts, psychological, physical demands and job insecurity that affect quality of life at work.

Our study stresses the need to carry out longitudinal studies to assess the work conditions and their aftermaths on the quality of life of critical care pediatric and neonatal physicians and nurses.

RESUMO

Objetivo: Investigar as relações entre trabalho e qualidade de vida de médicos e enfermeiros em unidades de terapia intensiva pediátrica e neonatal.

Métodos: Estudo transversal com 37 médicos e 20 enfermeiros. O *Job Content Questionnaire* (JCQ), *Effort-Reward Imbalance* (ERI), e *World Health Organization Quality of Life* (WHOQOL-100) foram utilizados. A correlação foi estimada através do coeficiente de correlação de Spearman.

Resultados: O esforço é inversamente correlacionado com os domínios: físico, psicológico, nível de independência, meio ambiente ($p < 0,01$) e relação social ($p < 0,05$). A recompensa é inversamente correlacionada com os domínios psicológico ($p < 0,05$) e nível de independência ($p < 0,01$). Controle sobre o trabalho é diretamente correlacionado com o domínio físico ($p < 0,05$). A demanda psicológica é inversamente correlacionada com os domínios físico ($p < 0,05$), psicológico ($p < 0,01$) e nível de independência ($p < 0,05$). A demanda física é inversamente correlacionada com os domínios físico, nível de independência, meio ambiente ($p < 0,01$) e psicológico ($p < 0,05$). Insegurança no trabalho é inversamente correlacionada com os domínios psicológico, nível de

independência ($p < 0,05$) e meio ambiente ($p < 0,01$). Suporte do supervisor é diretamente correlacionado com nível de independência ($p < 0,05$).

Conclusão: Médicos e enfermeiros apresentaram altos esforços, demandas psicológicas, físicas e insegurança no tra-

balho que repercutem na qualidade de vida.

Descritores: Unidades de terapia intensiva pediátrica/recursos humanos; Esgotamento profissional; Qualidade de vida; Satisfação no trabalho; Questionários

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