

Work satisfaction and stress among Portuguese neonatologists – 2019 survey

Gustavo Rocha¹, Filipa Flôr-de-Lima^{1,2}, Sara Almeida¹, Hercília Guimarães²

¹Department of Neonatology, Centro Hospitalar Universitário de São João, Porto, Portugal

²Faculty of Medicine of Porto University, Porto, Portugal

Abstract

Introduction: Work satisfaction and stress for doctors working in Neonatal Intensive Care Units (NICU) depend on several factors. The purpose of this survey was to assess work satisfaction and stress of neonatologists in Portugal.

Material and methods: Anonymous electronic survey, with 46 questions, sent by e-mail to all members of the Portuguese Society of Neonatology in 2019 (i.e., 205 neonatologists).

Results: 92 (44.9%) questionnaires were analyzed. Respondents were mostly female, aged 50-59 years, married and with children, working at a level IIIB NICU linked to university teaching. Most classified their clinical activity as satisfactory and prestigious. They often feel tired due to overwork, and fatigue affects physical, mental and social health. Most consider that the annual vacation days are not enough. The most stressful reported aspects were the emergency services, dealing with death situations, deciding to withdraw care, and dealing with decisions on the threshold of viability. Most respondents consider the age between 50 and 59 years old as adequate to stop doing emergency service. Some adverse working conditions, low salaries and the unmet need for scientific activity promotion were complaints placed by a significant number of doctors.

Discussion: The satisfaction level of neonatologists in Portugal is high. Emergency service is the main cause of stress. Overwork, low salaries, staff rejuvenation and scientific activity promotion are aspects that require a large investment.

Conclusion: This survey contributes to the national characterization of work satisfaction and stress of neonatologists, which may inform policies and interventions targeted at the needs of this group of clinicians.

Keywords

Work satisfaction, quality of life, stress, Neonatology, Portugal.

Corresponding author

Gustavo Rocha, Department of Neonatology, Centro Hospitalar Universitário de São João, Alameda Prof. Hernâni Monteiro, 4200 – 319 Porto, Portugal; phone: +351 225512100 extension 1949; fax: +351225512273; e-mail: gusrocha@sapo.pt.

How to cite

Rocha G, Flôr-de-Lima F, Almeida S, Guimarães H. Work satisfaction and stress among Portuguese neonatologists – 2019 survey. *J Pediatr Neonat Individual Med.* 2022;11(1):e110130. doi: 10.7363/110130.

Introduction

Work satisfaction for doctors working in Neonatal Intensive Care Units (NICU) depends on several factors [1]. The interest for the professional area, the feeling of prestige, the professional self-fulfillment, the teamwork, teaching, research and intellectual stimulation, the notion of the value of their work to the patient, families and society are positive aspects in the work of the neonatologist. On the contrary, overwork, stress caused by critical patients, dealing with infants death, lack of resources, the need to master the use of varied and difficult techniques in the treatment of the patient, the pressures imposed by the patient, time and families, the need to perform extra emergency services, night work, weekend loss, the need to perform more and more administrative work, loss of quality of life, staff disagreement, inadequate salary, lack of leisure time and time spent with their families are aspects that can negatively punctuate the work satisfaction of physicians [2, 3].

Job stress may be a greater problem than job dissatisfaction [3]. Burnout, an occupational stress directly related to the dissonance between job demands and available resources, has been shown to impact emotional well-being and professional performance among neonatologists [2].

The purpose of this study was to assess work satisfaction, main causes of dissatisfaction and stress, quality of life and leisure time of neonatologists in Portugal.

Material and methods

In order to carry out the study, an anonymous electronic survey was sent by e-mail to all members of the Portuguese Society of Neonatology in 2019 (i.e., 205 neonatologists). The research questionnaire was based on other questionnaires [1, 4-7]. The questionnaire included questions on personal data, professional

activity, satisfaction with working as a neonatologist, professional stress, in a total of 46 questions. It was also given the possibility to write other aspects that had not been asked in the questionnaire and that the respondents found that could be relevant to mention. The semantic validation of the questionnaire was carried out by three authors of the study (two doctors and a psychologist) and by three neonatologists unrelated to the study. We used the following classification of NICU level:

- level II (assistance to preterm infants with gestational age [GA] > 32 weeks);
- level IIIA (assistance to preterm infants with GA > 28 weeks);
- level IIIB (assistance to all GAs, possibility of high-frequency ventilation, inhaled nitric oxide and pediatric surgery);
- level IIIC (full spectrum of neonatal medical and surgical care including cardiothoracic surgery) [8].

The questionnaire was sent twice, with an interval of one month, so that clinicians who might not have had the opportunity to answer in the first round could do so in the second round.

This survey was authorized by the Ethics Committee of Centro Hospitalar Universitário de São João, Porto, Portugal.

Data collection and statistical analysis were performed with IBM® SPSS® Statistics v. 25. Continuous variables with symmetric distribution were characterized by mean (\pm standard deviation) and categorical variables by absolute and relative frequencies. To compare continuous variables, we used parametric (independent t-test) and Chi-squared or Fisher's exact test to compare categorical variables, the latter for expected values less than 5.

A statistical analysis was performed to evaluate differences between NICU levels and quality of life. A p-value less than 0.05 was considered statistically significant.

Results

Ninety-three neonatologists responded (45.4% response rate). One questionnaire was excluded due to inappropriate responses, and the results of 92 (44.9%) questionnaires were analyzed.

The respondents were mostly female, aged 50-59 years, married and with children (**Tab. 1**). Most respondents had between 20 and 29 years of professional experience in Neonatology, worked in a level IIIB Unit with 250-499 admissions per year and at least 2,500 deliveries per year and stated that their center is linked to university teaching, and that they participate in teaching (**Tab. 2**).

Table 1. Responders data (n = 92).

Gender	Female	70 (76.1%)
	Male	22 (23.9%)
Age (years)	< 40	18 (19.6%)
	40-49	21 (22.8%)
	50-59	33 (35.9%)
	≥ 60	14 (15.2%)
	Unknown	6 (6.5%)
	Marital status	Married/union
	Divorced/separated	13 (14.1%)
	Single	7 (7.6%)
	Widowed	2 (2.2%)
Children	Yes	77 (83.7%)
	No	15 (16.3%)

Table 2. Professional activity (n = 92) (continues in the next column).

Years of uninterrupted work in Neonatology	< 10	26 (28.3%)
	10-19	22 (23.9%)
	20-29	33 (35.9%)
	≥ 30	5 (5.4%)
	Unknown	6 (6.5%)
Unit level	II	17 (18.5%)
	IIIA	17 (18.5%)
	IIIB	42 (45.7%)
	IIIC	16 (17.3%)
Number of admissions per year	< 250	33 (35.9%)
	250-499	46 (50%)
	500-999	6 (6.5%)
	Unknown	7 (7.6%)
Number of deliveries per year	None	2 (2.2%)
	< 500	2 (2.2%)
	500-999	1 (1.1%)
	1,000-1,499	5 (5.4%)
	1,500-1,999	22 (23.9%)
	2,000-2,499	11 (12%)
	≥ 2,500	47 (51.1%)
Unknown	2 (2.2%)	
How often are you asked (or were you, while doing emergencies) to perform emergency service in an extraordinary regime due to lack of elements?	Very frequently	50 (54.3%)
	Frequently	27 (29.3%)
	Sometimes	13 (14.1%)
	Rarely	1 (1.1%)
	Never	1 (1.1%)
Do you feel subject to work overload?	Very frequently	31 (33.7%)
	Frequently	29 (31.5%)
	Sometimes	29 (31.5%)
	Rarely	2 (2.2%)
	Never	1 (1.1%)
Does the capacity of your service force you to transfer patients to other centers (due to a lack of vacancy in the NICU)?	Very frequently	11 (12%)
	Frequently	10 (10.9%)
	Sometimes	46 (50%)
	Rarely	21 (22.8%)
	Never	4 (4.3%)

Table 2. Professional activity (n = 92) (continues from the previous column).

Is the support from other specialties/sub-specialties adequate?	Always	6 (6.5%)
	Frequently	47 (51.1%)
	Sometimes	29 (31.5%)
	Rarely	7 (7.6%)
	Never	2 (2.2%)
	Unknown	1 (1.1%)
	Is the support of other specialties/sub-specialties fast?	Always
Frequently		44 (47.8%)
Sometimes		37 (40.2%)
Rarely		6 (6.5%)
Never		3 (3.3%)
Unknown		1 (1.1%)
Is your institution linked to a medical school?	No	30 (32.6%)
	Yes	62 (67.4%)
Do you participate, or have you participated (as a neonatologist), in university education?	No	39 (42.4%)
	Yes	53 (57.6%)
Do you like, or would you like, to participate in university education?	No	34 (36.9%)
	Yes	56 (60.9%)
	Unknown	2 (2.2%)
Does your center carry out scientific research studies (clinical or otherwise)?	Very frequently	8 (8.7%)
	Frequently	16 (17.4%)
	Sometimes	46 (50%)
	Rarely	18 (19.6%)
	Never	4 (4.3%)
Does your center participate in national or international multicenter studies/trials promoted by other centers?	Whenever requested	11 (11.9%)
	Frequently	17 (18.5%)
	Sometimes	48 (52.2%)
	Rarely	16 (17.4%)
Never	0	
Does your center usually organize courses and scientific meetings open to other neonatologists?	Very frequently	6 (6.5%)
	Frequently	14 (15.2%)
	Sometimes	31 (33.7%)
	Rarely	26 (28.3%)
	Never	15 (16.3%)
Does your center encourage and facilitate access to professional training (courses, congresses, others)?	No	11 (11.9%)
	Yes	80 (87%)
	Unknown	1 (1.1%)
Does your center provide financial support for professional training?	Very frequently	0
	Frequently	2 (2.2%)
	Sometimes	12 (13%)
	Rarely	24 (26.1%)
	Never	53 (57.6%)
Unknown	1 (1.1%)	
In addition to working in Neonatology, do you have a particular clinical activity?	No	30 (32.6%)
	Yes	62 (67.4%)
Do you work in Neonatology on an exclusivity contract?	No	66 (71.7%)
	Yes	26 (28.3%)
If you answered yes, do you feel adequately paid?	No	21 (81%)
	Yes	5 (19%)

Most respondents classify their clinical activity as satisfactory and very satisfactory, feel that their work is prestigious and feel professionally and intellectually accomplished (Tab. 3). They often feel extremely tired due to overwork, and that this fatigue affects physical and mental health, as well as family and social life (Tab. 4). Most develop strategies to reduce the effect of tiredness on their well-being and consider that annual vacation days are not enough. The most stressful reported aspects in clinical life are the emergency services, dealing with death situations, deciding to withdraw care, dealing with decisions on the threshold of viability and treating critically ill patients.

Table 3. Work satisfaction (n = 92) (continues in the next column).

How do you rate your satisfaction in treating patients?	Fully satisfied	0
	Very satisfied	42 (45.6%)
	Satisfied	42 (45.6%)
	Not very satisfied	7 (7.7%)
	Not at all satisfied	0
	Unknown	1 (1.1%)
How do you rate your satisfaction with the workload in your NICU?	Fully satisfied	0
	Very satisfied	4 (4.3%)
	Satisfied	41 (44.6%)
	Not very satisfied	38 (41.3%)
	Not at all satisfied	9 (9.8%)
Do you feel that your work is prestigious?	Extremely prestigious	1 (1.1%)
	Very prestigious	30 (32.6%)
	Some prestige	40 (43.4%)
	Little prestige	18 (19.6%)
	No	3 (3.3%)
Do you feel fulfilled as a neonatologist?	Fully	11 (12%)
	Very	28 (30.4%)
	Moderately	45 (48.9%)
	Little	8 (8.7%)
	Nothing	0
Do you feel intellectually and scientifically accomplished?	Fully	2 (2.2%)
	Very	17 (18.5%)
	Moderately	55 (59.8%)
	Little	17 (18.5%)
Do you think you do too much administrative work?	Nothing	1 (1.1%)
	Excessive	19 (20.6%)
	A lot	42 (45.7%)
	Some	26 (28.3%)
	Little	5 (5.4%)
How do you rate your relationship with the nursing staff?	Nothing	0
	Very good	41 (44.6%)
	Good	44 (47.8%)
	Reasonable	7 (7.6%)
	Bad	0
	Very bad	0

Table 3. Work satisfaction (n = 92) (continues from the previous column).

How do you rate your relationship with your colleagues?	Very good	28 (30.4%)
	Good	46 (50%)
	Reasonable	17 (18.5%)
	Bad	1 (1.1%)
	Very bad	0
How do you rate your quality of life?	Very good	3 (3.3%)
	Good	36 (39.1%)
	Reasonable	40 (43.5%)
	Bad	13 (14.1%)
	Very bad	0
Do you consider that your work as a neonatologist affects negatively your quality of life?	No	19 (20.7%)
	Yes, it affects much	33 (35.9%)
	Yes, it affects little	39 (42.3%)
	Unknown	1 (1.1%)
Do you have time for leisure activities?	Never	4 (4.3%)
	Little	60 (65.2%)
	Enough	25 (27.2%)
	Quite	3 (3.3%)
	Ever	0
How do you rate your remuneration for your work as a neonatologist?	Very well paid	0
	Well paid	4 (4.3%)
	Reasonably remunerated	21 (22.8%)
	Underpaid	39 (42.4%)
	Very poorly paid	28 (30.4%)
Would you choose Neonatology again as a professional area, if possible?	No	6 (6.5%)
	Yes	83 (90.2%)
	Unknown	3 (3.3%)

NICU: Neonatal Intensive Care Unit.

Table 4. Stress (n = 92) (continues on the next page).

How often do you feel extremely tired due to overwork in Neonatology?	Always	4 (4.3%)
	Frequently	31 (33.7%)
	With some frequency	44 (47.8%)
	Rarely	12 (13%)
	Never	1 (1.1%)
If so, do you consider that tiredness affects your physical health?	It does not affect	8 (8.7%)
	It affects little	49 (53.3%)
	It affects a lot	34 (37%)
	Unknown	1 (1.1%)
If so, do you consider that tiredness affects your mental health?	It does not affect	9 (9.8%)
	It affects little	41 (44.6%)
	It affects a lot	40 (43.5%)
	Unknown	2 (2.2%)
Does this fatigue affect your family and social life?	It does not affect	7 (7.6%)
	It affects little	31 (33.7%)
	It affects a lot	52 (56.2%)
	Unknown	2 (2.2%)

Table 4. Stress (n = 92) (continues from the previous page).

Do you develop strategies so that your professional life does not affect your well-being? (sports, leisure activities, meditation...)	No	21 (22.8%)
	Yes	70 (76.1%)
	Unknown	1 (1.1%)
Do you consider that the vacation days you have per year are sufficient for the type of work you do?	No	82 (89.1%)
	Yes	9 (9.8%)
	Unknown	1 (1.1%)
Which aspects do you find most stressful for you in your clinical practice?	Relationship with patients' parents	13
	Relationship with colleagues	14
	Treating critically ill patients	33
	Emergency services	39
	Dealing with death situations	37
	Dealing with decisions on the threshold of viability	34
	Deciding to withdraw care	37
	Lack of support from other specialties/sub-specialities	22
	Lack of vacancies with the need to frequently transfer patients	29
	Lack of human resources	4
At what age do you consider it appropriate to be exempt from night emergency service?	Overwork	3
	< 40 years old	0
	40-49 years old	12 (13%)
	50-59 years old	75 (81.5%)
	≥ 60 years old	4 (4.3%)
At what age do you consider it appropriate to be exempt from daytime emergency service?	Unknown	1 (1.1%)
	50-59 years old	66 (71.7%)
	60-70 years old	25 (27.2%)
	Unknown	1 (1.1%)

Most respondents consider the age group between 50 and 59 years old to be adequate to stop doing night and day emergency services.

In the observations field some comments were written:

1. the lack of human resources obliges to work overtime far beyond what is advisable;
2. neonatologists are underpaid;
3. the lack/blockage of renewal of the medical staff is associated to the risk of losing professional competences;
4. excessive work in emergency services, mainly those with an element working alone at night;
5. the injustice of the existence of different working regimes – with and without exclusivity – to carry out the same work;
6. the absence of age-based exemption from emergency service in private hospitals;
7. as it is a profession of great intensity and very exhausting, there should be the possibility of anticipating retirement;
8. the lack of recognition by hospital authorities/ Ministry of Health/Government of the effort, sacrifice and “physical/mental exhaustion” to be able to provide 24/24 h coverage in maternity wards;
9. night work should be accompanied by a weekly workload reduction, in addition to an improvement in its payment;
10. intensive activity should fall on the professional group of rapid wear professions;
11. working conditions have deteriorated in recent years, notably due to a shortage of health professionals, along with increased bureaucratic/administrative demand, coupled with insufficient and/or obsolete equipment;
12. it was created a (fair) expectation in the success rate, the pattern of which has been very difficult to maintain;
13. scientific activity should be promoted and facilitated, as well as regular updating of knowledge;
14. counting the time for retirement should be different since it is a wear and tear profession;
15. neonatologists should preferably start on thinking about others – neonates and family.

The comparison of relevant responses between NICU's levels II-III A versus IIIB-IIIC is reported in **Tab. 5**. **Tab. 6** reports factors related to the quality of life. The answers regarding work overload, the fact that work greatly affects physical and psychic health, insufficient vacation days, and little time for leisure activities were significantly associated with a not good quality of life.

Table 5. Comparison between NICU's levels II-III A versus levels III B-III C.

	Level II and level III A NICUs (n = 34)	Level III B and level III C NICUs (n = 58)	p-value
Age, mean (\pm SD)	50.3 (\pm 9)	48.9 (\pm 10.6)	0.552 ^c
Admissions per year, mean (\pm SD)	248.4 (\pm 83.2)	325.6 (\pm 126.3)	0.549 ^c
Frequent/very frequent emergency services on an extraordinary basis, n (%)	27 (79.4)	50 (86.2)	0.394 ^a
Frequent/very frequent work overload, n (%)	19 (55.9)	41 (70.7)	0.150 ^a
Frequent adequate support from other specialties/sub-specialties, n (%)	11 (32.4)	36 (62.1)	0.006 ^a
Frequent participation in multicenter studies, n (%)	8 (23.5)	9 (15.5)	0.339 ^a
Frequent/very frequent organization of scientific courses and meetings, n (%)	3 (8.8)	17 (29.3)	0.034 ^b
Work on an exclusive basis, n (%)	6 (17.6)	20 (34.5)	0.083 ^a
Satisfaction with the workload, n (%)	19 (55.9)	22 (37.9)	0.095 ^a
Poorly/very poorly paid, n (%)	19 (55.9)	48 (82.8)	0.005 ^a
Work greatly affects physical health, n (%)	10 (29.4)	24 (41.4)	0.251 ^a
Work greatly affects psychic health, n (%)	12 (35.3)	27 (46.6)	0.292 ^a
Insufficient vacation days, n (%)	33 (97.1)	50 (86.2)	0.147 ^b
Little time for leisure activities, n (%)	19 (55.9)	41 (70.7)	0.150 ^a
Fully/very fulfilled as a neonatologist, n (%)	11 (32.4)	28 (48.3)	0.136 ^a
Good quality of life, n (%)	15 (44.1)	23 (39.7)	0.675 ^a

^a Chi-squared test; ^b Fisher's exact test; ^c Independent t test.

NICU: Neonatal Intensive Care Unit.

Table 6. Factors related to quality of life.

		Good quality of life (n = 38)	Not good quality of life (n = 54)	p-value
Age, mean (\pm SD)		50.2 (10.8)	48.9 (9.5)	0.555 ^c
Admissions per year, mean (\pm SD)		279.2 (107.9)	309.3 (123.8)	0.245 ^c
Level of the NICU, n (%)	II and III A	15 (39.5)	19 (35.2)	0.675 ^a
	III B and III C	23 (60.5)	35 (64.8)	
Frequent/very frequent emergency services on an extraordinary basis, n (%)		29 (76.3)	48 (88.9)	0.108 ^a
Frequent/very frequent work overload, n (%)		17 (44.7)	43 (79.6)	0.001 ^a
Frequent adequate support from other specialties/sub-specialties, n (%)		21 (55.3)	26 (48.1)	0.501 ^a
Frequent participation in multicenter studies, n (%)		7 (18.4)	10 (18.5)	0.991 ^a
Frequent/very frequent organization of scientific courses and meetings, n (%)		9 (20.4)	11 (23.7)	0.704 ^a
Work on an exclusive basis, n (%)		10 (29.6)	16 (26.3)	0.728 ^a
Satisfaction with the workload, n (%)		26 (68.4)	15 (27.8)	< 0.001 ^a
Poorly/very poorly paid, n (%)		24 (63.2)	43 (79.6)	0.080 ^a
Work greatly affects physical health, n (%)		3 (7.9)	31 (57.4)	< 0.001 ^b
Work greatly affects psychic health, n (%)		6 (15.8)	33 (61.1)	< 0.001 ^a
Insufficient vacation days, n (%)		7 (18.4)	2 (3.7)	0.019 ^b
Little time for leisure activities, n (%)		18 (47.4)	42 (77.8)	0.003 ^a
Fully/very fulfilled as a neonatologist, n (%)		22 (57.9)	17 (31.5)	0.012 ^a

^a Chi-squared test; ^b Fisher's exact test; ^c Independent t test.

NICU: Neonatal Intensive Care Unit.

Discussion

This survey reports on work satisfaction, main causes of dissatisfaction and stress, quality of life and leisure time of neonatologists in Portugal. As far as we know, the current survey is the first providing

information on stress and satisfaction with the professional area of Neonatology in Portugal.

Before discussing the results of this survey, the authors wish to give brief information on data from Portugal. In Portugal, the health system is characterized by three coexisting systems: the National Health

Service (NHS), special social health insurance schemes for certain professions (health subsystems) and private health insurance. The NHS offers universal coverage and is totally free for infants. In addition, about 25% of the population is covered by health subsystems, 10% in private insurance and another 7% in mutual funds. The Ministry of Health is responsible for the development of national health policy as well as for the management of the NHS. The Health Regulatory Authority is the independent public entity responsible for regulating the activity of all health providers, whether public, private or social.

Neonatologists in Portugal are pediatricians with differentiated training in the area of Neonatology and work in public hospitals on an exclusive or non-exclusive basis. The latter, the majority, may work either in their private offices, as general pediatricians, and in private hospitals, as neonatologists or general pediatricians. There are about 205 neonatologists in Portugal.

According to data from the National Institute of Statistics (www.ine.pt), in Portugal the number of live births has been decreasing over the last years, from a peak of 120,071 in 2000 to 86,579 in 2019. This decline in natality is associated with improved living conditions, women's economic independence, greater use of contraception, a significant cultural change in relation to previous generations, and was aggravated by the financial crisis in Portugal from 2010 to 2014 that began as part of the global financial crisis of 2007-2008, in the context of the Eurozone public debt crisis, which mainly affected southern European countries and Ireland.

Professional activity

We can observe a predominance of female respondents, aged over 50 years, married and with children. This result contrasts with the finding in the Israeli survey by Moshe et al., in which a predominance of male neonatologists was reported [1].

The population of neonatologists in Portugal is a little aged, which is in line with some of the observations that refer to the need to rejuvenate the medical staff in Units. Also, we know that the role of women with children at home is of great importance and that, in most cases, causes an overload of work. Most also work in level IIIB NICUs with at least 2,500 births per year, in which they are often asked to perform extraordinary emergency services, and very often feel subject to overwork. This aspect and results have already been reported and analyzed in a literature review by Fogaça et al. [9].

The number of responses reporting the need to transfer patients to other Units due to lack of vacancies is very high and reaches 72.8%. This number demonstrates the inability of the responding Units to allocate all patients, at least in more critical periods. This is a subject already reported in other surveys [10], and an aspect that deserves reflection on the part of higher entities in order to take measures to enable the Units to be properly equipped in capacity to allocate patients.

Although the majority of respondents mentioned that the support of other specialties/sub-specialties is adequate and quick, a minority replied that this support is neither adequate nor quick. Neonatologists from level IIIB and level IIIC NICUs report more frequently an adequate support from other specialties/sub-specialties than neonatologists from level II and level IIIA NICUs.

Most respondents stated that their center sometimes, or rarely, organizes or participates in research studies or trials. Most centers rarely or sometimes organize courses and/or scientific meetings, but encourage access to vocational training. The majority of the centers do not provide financial support for vocational training. Neonatologists from level IIIB and level IIIC NICUs reported more frequent organization of scientific courses and meetings than those from level II and level IIIA NICUs.

It appears that, although many of the institutions are linked to university education and the majority of respondents participate in teaching, the organization of scientific research as well as participation in national and international multicentre studies is not high. It is not surprising that there is a low investment in the research area when a large number of professionals report excessive workload in the clinical activity at the NICU. Probably, a reduction in the clinical workload would allow clinicians to be able to play a role in the scientific research activity.

The majority of centers encourage access to professional training (courses, congresses, others) but do not provide financial support. This aspect reflects the lack of specific funds for such training. It is an aspect that deserves reflection, since the constant updating of knowledge is fundamental to the correct and updated clinical practice.

The vast majority of respondents need to exercise private clinical activity, and the minority working on an exclusive basis consider themselves underpaid. In the observations field of the questionnaire, it was mentioned that neonatologists are underpaid, and that there is injustice in the existence of different working regimes – with and without exclusivity – to carry out the same work. Also, neonatologists from level IIIB

and level IIIC NICUs responded more frequently to be poorly/very poorly paid than those from level II and level IIIA NICUs.

It is often mentioned by physicians that working conditions in the health system have deteriorated in recent years, aggravated by the financial crisis and budget restrictions that Portugal has suffered in recent years [11].

Work satisfaction

Job satisfaction is high. The majority feel that the profession has prestige. However, only a few consider themselves fully realized both as clinicians and scientifically. Most neonatologists report a good relationship with colleagues and nursing staff, consider themselves to be subject to a lot of administrative work, and classify their quality of life as reasonable or good; however, they report that the work as neonatologists negatively affects their quality of life. Most have little time for leisure activities; however, they say that they would choose Neonatology again as a professional area if they had to do it again. These results are in accordance with those of the Moshe et al. survey in Israel [1].

Stress

Despite the fact that Portuguese neonatologists feel satisfied at work and in professional relationships, they often feel tired due to overwork and report that it interferes with family and social lives, so most need to develop compensation strategies.

For NICU professionals, chronic occupational exposure to patient and family distress can be emotionally taxing. For physicians, stress and negative feelings have the potential to compromise the quality of patient care, as well as the mental and physical health of the physicians themselves [2].

The most stressful situations reported in this survey were the emergency services, dealing with death situations, deciding to withdraw care, dealing with decisions on the threshold of viability, treating critically ill patients, dealing with lack of beds with the need to transfer patients, and lack of support from other specialties/sub-specialties.

In Neonatology, dealing with decisions on the threshold of viability is a frequent issue that doctors have to face. Over the past decades, the survival of extremely preterm infants has tremendously improved along with neonatal care developments [12]. However, deciding to initiate, withhold or withdraw intensive care for infants born at the limit of viability

remains a difficult decision [13]. According to a recent retrospective cohort study of infants born between 22 and 27 completed weeks of gestation in Switzerland, a decision to withhold active treatment before or immediately after birth is taken only for a minority of these infants [14]. Instead, most infants born ≥ 24 weeks are offered provisional intensive care. Most extremely preterm infants who die in NICUs do so after a decision to redirect treatment from intensive care to comfort care (i.e., withdrawal of life-sustaining therapies) [15, 16].

Today, it is generally accepted that end-of-life decisions in extremely preterm infants should be made in a process involving physicians, nurses and parents [17, 18]. Also, NICU mental health professionals (NMHPs) are essential members of the NICU care team and should interact with all NICU parents/caregivers and family members. Collaboration among social workers, psychologists and psychiatric staff is strongly encouraged to provide support to both parents and NICU staff [19].

This makes it especially important to discuss and reflect upon the – possibly – diverse moral attitudes and values of stakeholders, and specifically in this study, health care professionals.

It has been shown that mortality rates adjusted for GA, gender and other risk factors vary widely between centers and countries [20, 21]. Moreover, end-of-life decisions are not only based on outcome statistics but are greatly influenced by the attitudes, values and perceptions of the reported outcomes by the different parties involved in this decisional process [22].

Although the emergency services were the main cause of stress for the surveyed neonatologists, the majority agrees with the 50-59 years old as the age range to stop doing daytime and/or nighttime emergency service.

Limitations of this study

The questionnaire had a response rate of 45%, a fact that may have contributed to changing the rate of some responses to the most relevant questions.

Conclusion

According to the results of this survey, the satisfaction level of neonatologists in Portugal is high. However, some adverse working conditions, overwork, low salaries and the unmet need for scientific activity promotion and facilitation, as well as regular updating of knowledge, were some of the complaints placed by a significant number of neonatologists.

This survey contributes to the national characterization of work satisfaction and stress of neonatologists, which may inform policies and interventions targeted at the needs of this group of clinicians.

Acknowledgements

The Authors would like to thank all neonatologists that participated in this survey, as well as the neonatologists who aided in testing and validating the questionnaire. Furthermore, they thank Dr. Joana Saldanha, president of the Portuguese Society of Neonatology in 2019, for the collaboration provided in sending the survey to all members of the society.

Ethical approval

This survey was authorized by the Ethics Committee of Centro Hospitalar Universitário São João, Porto, Portugal.

Declaration of interest

The Authors declare that they have no conflict of interest. There is no funding source.

References

- Moshe M, Perry ZH, Salzer L, Zemora E, Toker A. Work satisfaction, quality of life, and leisure time of neonatology fellows and senior neonatologists in Israel. *Isr J Health Policy Res.* 2012;14(1):50.
- Weintraub AS, Geithner EM, Stroustrup A, Waldman ED. Compassion fatigue, burnout and compassion satisfaction in neonatologists in the US. *J Perinatol.* 2016;36(11):1021-6.
- Clarke TA, Maniscalco WM, Taylor-Brown S, Roghmann KJ, Shapiro DL, Hannon-Johnson C. Job satisfaction and stress among neonatologists. *Pediatrics.* 1984;74(1):52-7.
- Bovier PA, Perneger TV. Predictors of work satisfaction among physicians. *Eur J Public Health.* 2003;13:299-305.
- Linn LS, Yager J, Cope D, Leake B. Health status, job satisfaction, job stress, and life satisfaction among academic and clinical faculty. *JAMA.* 1985;254(19):2775-82.
- Williams ES, Skinner AC. Outcomes of Physician Job Satisfaction: A Narrative Review, Implications, and Directions for Future Research. *Health Care Manage Rev.* 2003;28(2):119-39.
- Thommasen HV, Lavanchy M, Connelly I, Berkowitz J, Grzybowski S. Mental health, job satisfaction, and intention to relocate. Opinions of physicians in rural British Columbia. *Can Fam Physician.* 2001;47:737-44.
- Gracia SR, Lorenzo JRF, Urcelay IE, Mussons FB, Carrillo GH, Hernando JM, García ES, Sánchez-Luna M; Comité de Estándares y la Junta Directiva de la Sociedad Española de Neonatología. [Health Care Levels and Minimum Recommendations for Neonatal Care]. [Article in Spanish]. *An Pediatr (Barc).* 2013;79(1):51.e1-11.
- Fogaça MC, de Carvalho WB, Cítero VA, Nogueira-Martins LA. Factors that cause stress for physicians and nurses working in a pediatric and neonatal intensive care unit: bibliographic review. *Rev Bras Ter Intensiva.* 2008; 20(3):261-6.
- Gill AB, Bottomley L, Chatfield S, Wood C. Perinatal transport: Problems in neonatal intensive care capacity. *Arch Dis Child Fetal Neonatal Ed.* 2004;89:F220-3.
- Guimarães H, Boix H, Rodrigues C, Tomé T, Rocha G, Vento M. Impact of the global financial crisis on newborn care in Portugal and Spain: perception of health professionals. *Acta Paediatr.* 2020;109(3):625-7.
- Marlow N. Keeping up with outcomes for infants born at extremely low gestational ages. *JAMA Pediatr.* 2015;169(3):3-4.
- Fanaroff JM, Hascoet JM, Hansen TWR, Levene M, Norman M, Papageorgiou A, Shinwell E, van de Bor M, Stevenson DK; International Perinatal Collegium (IPC). The ethics and practice of neonatal resuscitation at the limits of viability: an international perspective. *Acta Paediatr.* 2014;103(7):701-8.
- Berger TM, Steurer MA, Bucher HU, Fauchere JC, Adams M, Pfister RE, Baumann-Holzle R, Bassler D, on behalf of the Swiss Neonatal End-of-Life Study Group. Retrospective cohort study of all deaths among infants born between 22-27 completed weeks of gestation in Switzerland over a three-year period. *BMJ Open.* 2017;7:e015179.
- Hellmann J, Knighton R, Lee SK, Shah PS. Neonatal deaths: prospective exploration of the causes and process of end-of-life decisions. *Arch Dis Child Fetal Neonatal Ed.* 2016;101(2):F102-7.
- Verhagen AA, Dorscheidt JH, Engels B, Hubben JH, Sauer PJ. End-of-life decisions in Dutch neonatal intensive care units. *Arch Pediatr Adolesc Med.* 2009;163(10):895-901.
- Lemyre B, Daboval T, Dunn S, Kekewich M, Jones G, Wang D, Mason-Ward M, Moore GP. Shared decision making for infants born at the threshold of viability: a prognosis-based guideline. *J Perinatol.* 2016;36(7):503-9.
- Pham-Nguyen AT, Ho LY. Review on neonatal end-of-life decision-making: medical authority or parental autonomy? *Proc Singapore Healthc.* 2013;22:140-5.
- Hynan MT, Steinberg Z, Baker L, Cicco R, Geller PA, Lassen S, Milford C, Mounts KO, Patterson C, Saxton S, Segre L, Stuebeet A. Recommendations for mental health professionals in the NICU. *J Perinatol.* 2015;35:S14-8.
- De Leeuw R, Cuttini M, Nadai M, Berbik I, Hansen G, Kucinkas A, Lenoir S, Levin A, Persson J, Rebagliato M, Reid M, Schroell M, Vonderweid U; EURONIC study group. Treatment choices for extremely preterm infants: an international perspective. *J Pediatr.* 2000;137(5):608-16.
- Geurtzen R, Draaisma J, Hermens R, Scheepers H, Woiski M, van Heijst A, Hogeveen M. Perinatal practice in extreme premature delivery: variation in Dutch physicians' preferences despite guideline. *Eur J Pediatr.* 2016;175(8):1039-46.
- Verhagen E, Janvier A. How babies die and why this is important to clinicians, researchers and parents. In: Verhagen E, Janvier A (Eds.). *Ethical Dilemma's for Critically Ill Babies.* Volume 65. Dordrecht: Springer, 2016.

Annex 1. Job satisfaction and stress among Portuguese neonatologists in level II and III Units – National survey (continues on the next page).

Dear colleague, this survey is optional and anonymous. It aims to get to know the state of job satisfaction and stress of national neonatologists. The survey was authorized by the Health Ethics Committee of the survey center and the results will be published in written text. Thank you in advance for your participation.

I. Personal data

1. Gender: female/male
2. Age: _____ (years)
3. Marital status: married/union; single; divorced/separated; widowed
4. Have child(ren): No/Yes

II. Professional activity

1. How many years do you have of uninterrupted work in Neonatology? _____
2. Level of the Unit to which it belongs:
 1. Level II (assistance to preterm newborns with GA > 32 weeks): No/Yes
 2. Level IIIA (assistance to preterm newborns with GA > 28 weeks): No/Yes
 3. Level IIIB (assistance to all GAs, possibility of high-frequency ventilation, inhaled nitric oxide and pediatric surgery): No/Yes
 4. Level IIIC (full spectrum of neonatal medical and surgical care including cardiothoracic surgery): No/Yes
3. How many admissions/year does the Unit where you work have? _____
4. How many births/year take place in your center? _____
5. How often are you asked (or were you, while doing emergencies) to perform emergency service in extraordinary regime due to lack of elements?
 1. Never
 2. Rarely
 3. Sometimes
 4. Frequently
 5. Very frequently
6. Do you feel subject to work overload?
 1. Never
 2. Rarely
 3. Sometimes
 4. Frequently
 5. Very frequently
7. Does the capacity of your service force you to transfer patients to other centers (due to lack of vacancy in the NICU)?
 1. Never
 2. Rarely
 3. Sometimes
 4. Frequently
 5. Very frequently
8. Is the support from other specialities/sub-specialities adequate?
 1. Never
 2. Rarely
 3. Sometimes
 4. Frequently
 5. Always
9. Is the support of other specialities/sub-specialities fast?
 1. Never
 2. Rarely
 3. Sometimes
 4. Frequently
 5. Always
10. Is your institution linked to a medical school? No/Yes
11. Do you participate, or have you participated (as a neonatologist), in university education? No/Yes
12. Do you like, or would you like, to participate in university education? No/Yes
13. Does your center carry out scientific research studies (clinical or otherwise)?
 1. Never
 2. Rarely
 3. Sometimes
 4. Frequently
 5. Very frequently
14. Does your center participate in national or international multicenter studies/trials promoted by other centers?
 1. Never
 2. Rarely
 3. Sometimes
 4. Frequently
 5. Whenever requested

Annex 1. Job satisfaction and stress among Portuguese neonatologists in level II and III Units – National survey (continues from the previous page and on the next page).

15. Does your center usually organize courses and scientific meetings open to other neonatologists?
 1. Never
 2. Rarely
 3. Sometimes
 4. Frequently
 5. Very frequently
16. Does your center encourage and facilitate access to professional training (courses, congresses, others)? No/Yes
17. Does your center provide financial support for professional training?
 1. Never
 2. Rarely
 3. Sometimes
 4. Frequently
 5. Very frequently
18. In addition to working in Neonatology, do you have a particular clinical activity? No/Yes
19. Do you work in Neonatology on an exclusivity contract? No/Yes
If you answered yes, do you feel adequately paid? No/Yes
20. If you answered No in paragraph 19, would you like to be able to work on an exclusivity contract in your Neonatology service?
 1. No, even if properly paid
 2. Yes, as long as properly remunerated

III. Satisfaction

1. How do you rate your satisfaction in treating patients?
 1. Not at all satisfied
 2. Not very satisfied
 3. Satisfied
 4. Very satisfied
 5. Fully satisfied
2. How do you rate your satisfaction with the workload in your NICU?
 1. Not at all satisfied
 2. Not very satisfied
 3. Satisfied
 4. Very satisfied
 5. Fully satisfied
3. Do you feel that your work is prestigious?
 1. No
 2. Little prestige
 3. Some prestige
 4. Very prestigious
 5. Extremely prestigious
4. Do you feel fulfilled as a neonatologist?
 1. Nothing
 2. Little
 3. Moderately
 4. Very
 5. Fully
5. Do you feel intellectually and scientifically accomplished?
 1. Nothing
 2. Little
 3. Moderately
 4. Very
 5. Fully
6. Do you think you do too much administrative work?
 1. Nothing
 2. Little
 3. Some
 4. A lot
 5. Excessive
7. How do you rate your relationship with the nursing staff?
 1. Very bad
 2. Bad
 3. Reasonable
 4. Good
 5. Very good
8. How do you rate your relationship with your colleagues?
 1. Very bad
 2. Bad

Annex 1. Job satisfaction and stress among Portuguese neonatologists in level II and III Units – National survey (continues from the previous page).

3. Reasonable
 4. Good
 5. Very good
 9. How do you rate your quality of life?
 1. Very bad
 2. Bad
 3. Reasonable
 4. Good
 5. Very good
 10. Do you consider that your work as a neonatologist affects negatively your quality of life?
 1. No
 2. Yes, it affects little
 3. Yes, it affects much
 11. Do you have time for leisure activities?
 1. Never
 2. Little
 3. Enough
 4. Quite
 5. Ever
 12. How do you rate your remuneration for your work as a neonatologist ?
 1. Very poorly paid
 2. Underpaid
 3. Reasonably remunerated
 4. Well paid
 5. Very well paid
 13. Would you choose Neonatology again as a professional area, if possible? No/Yes
- IV. Stress**
1. How often do you feel extremely tired due to overwork in Neonatology?
 1. Never
 2. Rarely
 3. With some frequency
 4. Frequently
 5. Always
 2. If so, do you consider that this tiredness affects your physical health?
 1. It does not affect
 2. It affects little
 3. It affects a lot
 3. If so, do you consider that tiredness affects your mental health?
 1. It does not affect
 2. It affects little
 3. It affects a lot
 4. Does this fatigue affect your family and social life?
 1. It does not affect
 2. It affects little
 3. It affects a lot
 5. Do you develop strategies so that your professional life does not affect your well-being? (sport, leisure activities, meditation...)? No/Yes
 6. Do you consider that the vacation days you have per year are sufficient for the type of work you do? No/Yes
 7. Which aspects do you find most stressful for you in your clinical practice?
 - a. Relationship with patients' parents: No/Yes
 - b. Relationship with colleagues: No/Yes
 - c. Treating critically ill patients: No/Yes
 - d. Emergency services: No/Yes
 - e. Dealing with death situations: No/Yes
 - f. Dealing with decisions on the threshold of viability: No/Yes
 - g. Deciding to withdraw care: No/Yes
 - h. Lack of support from other specialties/sub-specialties: No/Yes
 - i. Lack of vacancies with the need to frequently transfer patients: No/Yes
 - j. Other, specify: _____
 8. At what age do you consider it appropriate to be exempt from night emergency service? _____ (years)
 9. At what age do you consider it appropriate to be exempt from daytime emergency service? _____ (years)
- Observations (if you want to add any information you consider relevant): _____
- Thank you for your participation