

# Neonatology Nurses' Problems and Quality of Life

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**Abstract:** *Aim:* Working in a shift system can disturb quality of life due to chronic fatigue, sleepiness and somatic symptoms. This study aimed to determine the working conditions and problems encountered by nurses working in the neonatal intensive care unit (NICU) and the effect on their quality of life.

*Method:* Nurses who were a member of the Neonatology Nursing Association of Turkey were included in the study. The study sample consisted of 256 nurses. Data were collected with the descriptive data form and SF-36 quality of life scale. The data were evaluated by frequency, percentage, and Spearman's test.

*Results:* Mean duration of work in the NICU was 4.8±3.97 years. Nurses mostly worked day and night shifts (60.9%); the mean duration of work was 14.4±3.01 hours per shift. A nurse cared for 5.3±1.27 neonates on average. 9.8% of the nurses were satisfied with the working environment. Common causes of dissatisfaction were low wages, high newborn ratio per nurse and the excessive working hours. 97.3% of nurses stated that working in the unit has an effect on their health. For SF-36 subgroups, the physical function score was high (62.5 ± 23.7), while the scores of the other subgroups were under 50 points. The lowest score was role-physical (28.5±33.2). The nurses' quality of life scores were low in general.

*Conclusion:* This research was made in order to determine the working conditions of neonatology nurses and the effects of these on their health and life quality

**Keywords:** NICU, Nurse, Health problems, Quality of life, Working conditions.

## INTRODUCTION

Health and quality of life are essential for every individual. Health workers who provide care cannot be successful in maintaining their life quality and health [1]. Reasons for this are: irregular working hours for health workers, especially nurses working in a shift system, giving care to patients with complex and life-threatening illnesses, intensive work load, and giving emotional support to patients and relatives [2].

Working in a shift system can cause many physical changes. In particular, there is strong evidence that it has negative effects on peptic ulcers, coronary heart disease and pregnancy [3-5]. In addition, sleep disturbances in nurses can increase the risk of accidents for both themselves and patients [6, 7]. Furthermore, working in a shift system is also a risk factor for the occurrence of psychiatric disorders in nurses and low quality of life [8]. These factors can also cause stress, tension and psychiatric problems regarding their job [1-2]. Long working hours, excessive workload, control deficiency on work and inadequate social support can also cause psychiatric problems [9].

Health service insufficiency, unbalanced distribution of service and personnel, and high work load of nurses can also affect the health and life quality of nurses [10]. Working environment is another factor that affects health workers [4]. The researchers worked with radiologists, doctors, nurses, physiotherapists, and found that nurses and doctors have the most intensive work. The biggest stress sources for nurses were determined to be ringing telephones, the need to be nice all the time, insufficient wages and time pressures [11].

One of the most intensive working environments for nurses is neonatal intensive care units (NICUs). NICUs are complex environments in which caregivers from different disciplines work together under continuous stress. The NICU nurse deals primarily with premature newborns and those with congenital defects that are life-threatening [12]. Neonatal nurses are some of the most experienced nurses, according to workload and stress.

It is obvious that working conditions affect the health and life conditions of nurses. This study was performed in Turkey in order to determine the effects of working conditions on the health and life quality of nurses who work in NICU which has a high workload and stress rate.

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Research questions are:

1. What are the working conditions of neonatology nurses like?
2. What are the effects of working conditions in neonatology intensive care units on nurses' health in their opinion?
3. What are the points in the subgroups of life quality scale for neonatology nurses?
4. Is there a relation between socio-demographic characteristics, working conditions and life quality scale points for neonatology nurses?

## METHODS

### Study Sample

Research was conducted as described by the Turkish Association of Neonatal Nursing. The population of the study included nurses who are the members of the association. In the research, specific sample choice was not made and nurses who had been working in a neonatal intensive care unit for at least 3 months and had completed orientation period, as well as all nurses who work in a level III NICU, constituted the research sample. The association includes 405 registered and active members. Description and question forms were sent by e-mail to these 405 nurses. 281 out of 405 completed the survey and returned the questionnaire via e-mail (participation rate 69.3%). However, 9 forms had incomplete information, 5 nurses had been working in a NICU for less than 3 months and 11 nurses were working at level II NICUs; therefore, 25 persons were left out of the study and 256 nurses created the final sample of the research (participation rate 63.2%).

### Data Collection Instruments

In this study, 3 forms were used for collecting data, the identifier characteristic form for nurses, the survey form for determining health conditions and the SF-36 life quality scale:

- The identifier characteristic form for nurses includes 7 questions that query gender, age, graduation data, working time in the profession and as a neonatology nurse, level of the neonatal intensive care unit and tasks in clinic.
- The survey form for determining health and work conditions consists of 9 questions. It questions if they voluntarily chose to work in that service,

working type in clinic (night/day etc.), average neonate number in each shift, average working hours in a week, satisfaction with working environment (with choices of satisfied, partially satisfied, not satisfied and other), if they are partially satisfied or not satisfied then the reason/reasons for that, the effects of working in a NICU on their health (with a choice of yes/no), if they are affected, then in which way the effect is shown (there are subtitles such as sleeping, headache, pregnancy/lactation, immune system, eating problems, gastrointestinal tract [gastritis etc.], weakness/fatigue, musculoskeletal system problems [varicose veins, lower back pain etc.], chronic illness, psychological/emotional, social issues, and "other" with room for additional information provided). The form was created by the researchers after searching the literature [4, 13-16].

- The Medical Outcomes Study Short Form-36 Health Survey Questionnaire (SF-36) was especially developed by Ware and Sherbourne (1992) for the measurement of life quality in people with physical disease and was translated into Turkish prior to a validity and reliability study being performed. SF-36 examines 8 aspects of health: physical function, physical role difficulty, pain, general health perception, vitality (vigour, energy), social function, emotional role difficulty and mental health; these are assessed by 36 items. For reliability study of the scale, for each subscale, the Cronbach alpha coefficient is calculated and found to be between 0.73-0.76. There is no total point for the scale; the total points of each subdimension (scale) are calculated separately and the points differ between 0-100. 100 points shows a good health condition, while 0 points shows a poor health condition [17].

### Data Collection Procedure

Data of the research were collected between May and June 2013. Forms were sent to the nurses who are members of the association via e-mail. Forms were prepared in a pdf format with options that can be marked and open-ended questions that can be completed. Forms were filled in on the computer by nurses, registered and then returned to the e-mail address. One month was provided for re-sending the survey forms and 2 reminder e-mails were sent. Completing the form took 10-15 minutes.

Pre-implementation was made for data collection forms with 10 neonatology nurses who chose to fill in the form and work in a level III NICU of a hospital, but were not members of the association. After pre-implementation there was no need for correction and the results of that were not taken into account.

### Statistical Analysis

In this study, data sets were evaluated with the SPSS 20.0 package program and values were specified as number and percentage. Compliance of scale points to normal distribution was tested using visual (histogram) and analytical methods (Kolmogorov-Smirnov). According to the results, it was determined that general health (K-S = 0.091;  $p = 0.001$ ), physical function (K-S = 0.082;  $p = 0.001$ ), physical role (K-S = 0.254;  $p = 0.001$ ), emotional role (K-S = 0.293;  $p = 0.001$ ), energy (K-S = 0.066;  $p = 0.009$ ), mental health (K-S = 0.084;  $p = 0.001$ ), social function (K-S = 0.134;  $p = 0.001$ ), pain (K-S = 0.110;  $p = 0.001$ ), age of the nurse (K-S = 0.145;  $p = 0.001$ ), years working as a nurse in neonatology (K-S = 0.159;  $p = 0.001$ ), work periods in shifts (K-S = 0.451;  $p = 0.001$ ), work periods per week (K-S = 0.239;  $p = 0.001$ ) and number of examined neonates (K-S = 0.178;  $p = 0.001$ ) did not show normal distribution. As the variables did not show normal distribution, correlation coefficients and statistical significances were calculated with the Spearman test.

### RESULTS

The mean age of nurses was determined as  $30.09 \pm 5.25$  (min.-max. = 20-44), the average number of years worked was  $8.85 \pm 5.83$  and average number of years working as a neonatology nurse was  $4.80 \pm 3.97$ . It

**Table 1: Descriptive Characteristics of Nurses (n = 256)**

Descriptive Characteristics	X $\pm$ SD*	Min.-Max.
Age	30.09 $\pm$ 5.25	20-44
Working duration as a nurse (year)	8.85 $\pm$ 5.83	0.9-25
Working duration as a neonatology nurse (year)	4.80 $\pm$ 3.97	0.5-22
Gender	n	%
Female	243	94.9
Male	13	5.1
Present occupation		
Ward nurse	238	93.0
Ward head nurse	18	7.0

\*X = Mean; SD = Standard deviation

was determined that most of the nurses were female (94.9%) and were working as ward nurses in units (93.0%) (Table 1).

The average working hours of nurses in each shift were  $14.4 \pm 3.01$ , the average working hours in each week were  $47.8 \pm 5.06$  and the average number of neonates examined in each shift was  $5.3 \pm 1.27$ . Nurses working in both day and night shifts were more than others (60.9%). Most of the nurses (50.4%) did not start working in a neonatal intensive care unit voluntarily and most of them were partially satisfied or not satisfied with this unit ( $n = 231$ , 90.2%). The leading causes of dissatisfaction were poor salaries/bonus payments (92.2%), the large number of neonates per nurses (72.7%), extreme working hours (70.9%), inadequate physical conditions in the unit (48.0%), and problems with the institution management (45.4%) (Table 2).

**Table 2: Characteristics of Nurses' Working Conditions (n = 256)**

Working Conditions	n	%
Working hours per shift (X $\pm$ SD*) (Min.-Max.)	14.4 $\pm$ 3.01	5-17
Working hours per week (X $\pm$ SD*) (Min.-Max.)	47.8 $\pm$ 5.06	40-60
Caring newborn number per shift (X $\pm$ SD*) (Min.-Max.)	5.3 $\pm$ 1.27	2-9
Working type in ward		
Day shifts	55	21.5
Night Shifts	45	17.6
Day and night shifts	156	60.9
Choose voluntary to work in NICU		
With voluntary	127	49.6
Without voluntary	129	50.4
Satisfaction while working in NICU		
Satisfied	25	9.8
Partially satisfied	163	63.7
Dissatisfied	68	26.6
Causes of dissatisfaction**		
Low wage/additional payments	213	92.2
High newborn/nurse ratio	168	72.7
More working hours	164	70.9
Inadequacy physical environment in unit	111	48.0
Administrative issues at work	105	45.4
Others***	9	3.8

\*X = Mean; SD = Standard deviation

\*\*Numbers and percentages of nurses, who stated their satisfaction situation as "partially satisfied" and "dissatisfied", were given on  $n = 231$  for every item.

\*\*\*Stated as communication problems with health team ( $n = 4$ ), working on weekends ( $n = 3$ ), working without sufficient training ( $n = 2$ ).

In the study, 249 of 256 nurses expressed that their work affected their health (97.3%). It was determined that, as a result of working in the unit, nurses can have weakness/fatigue complaints (91.1%), sleep problems related to day and night work (85.1%), musculoskeletal problems such as back pain and leg pain (83.1%), headache complaints (72.2%), emotional/ psychological problems such as exhaustion, irritability, anxiety, depressed moods (47.3%), gastrointestinal system problems, such as ulcers due to less hydration and constipation (38.5%), eating problems such as a shift in eating patterns as a result of working day and night shifts and decreased appetite (36.1%), frequent infections due to affected immune systems (34.5%), and problems during pregnancy and lactation (20.8%). Nurses did not have chronic disease while they were working, but 22 nurses (8.8%) reported that there was a management problem regarding chronic diseases (increased FMF disease attacks, hypoglycemia, hyperglycemia, and hypertension), (Table 3)

**Table 3: Effects of Working Conditions on Nurses' Health According to Their Statements (n = 256)**

Effects of Working Conditions on Nurses' Health	n	%
Did working in NICU affect their health?		
Affected	249	97.3
Not affected	7	2.7
How was their health affected?*		
Weakness/fatigue	227	91.1
Sleep problems	212	85.1
Musculoskeletal problems	207	83.1
Headaches	180	72.2
Emotional/psychological problems	118	47.3
Gastrointestinal system problems	96	38.5
Eating problems	90	36.1
Disruption of immune system	86	34.5
Problems during pregnancy and lactation	52	20.8
Chronic diseases	22	8.8
Others**	19	7.6

\*Numbers and percentages of nurses, who stated their health was affected, were given on n = 249 for every item.

\*\*Others: Social problems such as less time spend with families and relatives (n = 7), skin problems such as dermatitis (n = 5), optical problems (n = 4), continuing to hear the machine sounds after work (n = 3).

In Table 4, the average points of nurses' life quality scale are given. For the SF-36 subgroups, the physical function score was high (62.5 ± 23.7), while the scores of the other subgroups were under 50 points. Lower

scores were role-physical (28.5 ± 33.2), pain (33.2 ± 18.7), and role-emotional (34.5 ± 38.8).

**Table 4: Nurses' Average Scores of SF - 36 Scale (n = 256)**

Subgroups	X±SD	Median	Min.-Max.
General health	37.2±19.9	35.0	0-100
Physical function	62.5±23.7	63.0	0-100
Role-physical	28.5±33.2	25.0	0-100
Role-emotional	34.5±38.8	33.3	0-100
Energy	45.4±19.2	45.0	0-100
Mental Health	49.1±16.6	52.0	0-88
Social function	46.1±20.6	50.0	0-100
Pain	33.2±18.7	32.5	0-90

The relationship between the SF-36 life quality scale point averages and descriptive characteristics and working conditions is given in Table 5. As the age of the nurse increased, general health (r = 0.179; p = 0.004) and physical function (r = 0.135; p = 0.031) scale points also increased and the correlation was found to be statistically significant. When we look at the correlation matrix, there is a low-middle degree (r = between -0.189 and -0.428) but extremely significant (p < 0.003) correlation between scale subgroups and voluntarily working in the unit and working satisfaction. When we looked at the scale sub-points of nurses who came to the unit without a choice and the satisfaction levels "partially satisfied" or "not satisfied", it was shown that they had low points. There was no correlation between life quality scale subgroup and the gender of nurses, years working as a neonatal nurse, weekly working time and working periods in each shift, and number of neonates examined in each shift (p > 0.05).

## DISCUSSION

As neonatology nurses provide care in a very specific field that copes with neonatal care, which has special requirements, complex clinical and ethical problems are encountered at an increasing rate. This caseload has extra responsibility for neonatology nurses and, therefore, they need to be more advanced with regard to their roles as advisor, advocate, and care provider [18]. Because of that, nurses who work in NICU can encounter high levels of physical and psychological stress.

**Table 5: Examining the Correlation Between Average Scores of SF – 36 Scale and Descriptive and Working Condition Characteristics of Nurses**

	..	SF – 36 Scale Subgroups							
		General Health	Physical Function	Role Physical	Role Emotional	Energy	Mental Health	Social Function	Pain
Age	r	0.179	0.135	0.061	0.000	0.033	-0.061	-0.067	0.031
	p	0.004*	0.031*	0.332	1.000	0.604	0.331	0.284	0.621
Gender	r	0.076	-0.019	0.048	-0.024	0.074	0.024	0.058	-0.088
	p	0.227	0.757	0.449	0.698	0.240	0.703	0.355	0.161
Working year a neonatology nurse	r	-0.032	0.102	-0.103	-0.068	0.036	-0.004	-0.118	0.025
	p	0.614	0.105	0.102	0.280	0.568	0.947	0.059	0.688
Working hour per week	r	-0.030	0.071	-0.081	0.032	0.001	0.052	0.121	0.017
	p	0.638	0.260	0.198	0.605	0.993	0.404	0.053	0.781
Working hour per shift	r	-0.001	-0.001	-0.067	-0.040	0.013	-0.012	0.116	-0.094
	p	0.987	0.984	0.287	0.529	0.841	0.852	0.064	0.132
Caring newborn number per shift	r	0.006	0.003	-0.054	-0.027	-0.070	-0.082	0.020	0.092
	p	0.919	0.957	0.392	0.671	0.268	0.190	0.751	0.141
Chose voluntarily to work in NICU	r	-0.221	-0.201	-0.189	-0.209	-0.362	-0.317	-0.234	-0.278
	p	0.001*	0.001*	0.002*	0.001*	0.001*	0.001*	0.001*	0.001*
Satisfaction while working in NICU	r	-0.397	-0.204	-0.196	-0.258	-0.428	-0.287	-0.318	-0.377
	p	0.001*	0.001*	0.002*	0.001*	0.001*	0.001*	0.001*	0.001*

\*p < 0.05, \*\*r = correlation coefficient

Stress at work, exhaustion, decreased job satisfaction, and emotional and mental fatigue can cause a decrease in sense of personal accomplishment [13]. Besides, factors like stress at work and low work satisfaction can cause nurses to leave work (turnover), resulting in nursing shortages, decreases in care quality and increased care costs [14, 15]. In addition to all of these negative effects, there can be unfavorable (negative) effects on the health care professionals' behavior and health [3, 4].

In our research, it was determined that average working hours of nurses in each shift and in each week and average number of neonates cared per nurse were high. For the calculation of patient numbers per nurse, there needs to be a special work density and work load analysis for each unit. Because of that, it is not easy to give a standard value for the correct patient-nurse ratio [19]. However, in a study in neonatology units, a baby-to-nurse ratio of 1:1 in high-risk babies was found to decrease mortality risk by 48% [20]. For patient safety, it is important to be sure that there is a sufficient quality and quantity of nurses [21, 22]. Increases in nurse needs and decreases in their proficiency causes worsening patient outcomes [20]. Especially in neonatal intensive care units, both nurse need and patient safety are important issues [23]. Excessive working hours of nurses can affect patient safety.

Excessive working hours and shift working methods can have negative effects on sleep patterns, performance, and nurse and patient safety. If nurses work more than 12.5 hours in one shift, their attention time at work decreases and the risk of accidents at work or medical errors increases [24]. In our study, it can be seen that working hours and nurse-to-baby ratios are higher in neonatal intensive care units.

In our study, it was determined that most of the nurses were partially satisfied or not satisfied with their units (90.2%). The leading causes of dissatisfaction were poor salaries/bonus payments (92.2%), the large number of neonates per nurse (72.7%), and extreme working hours (70.9%) (Table 2). It was showed in a study that the life satisfaction of nurses has a negative correlation with extreme workload, shifted working methods and negative environmental effects [25]. When working conditions and the environment are at the desired level, the job outcomes of nurses are better and the quality of care is increased [26].

In this research, most of the nurses (97.3%) expressed that working in the unit affects their health. It was determined that nurses have problems such as weakness/fatigue (91.1%), sleep (85.1%), and musculoskeletal system problems (83.1%) (Table 3). Sleep problems, fatigue, and gastrointestinal system

disorders can increase in health personnel who work in shifts [5]. Besides, when the organizational climate is bad, musculoskeletal injuries in nurses can increase [27]. In our study, sleep-wake cycle disturbances, physical environment inadequacy, extreme working hours and increased baby-to-nurse ratios can affect the development of both physical and psychological/emotional problems.

In our study, it was determined that, in the life quality scale about perceived health, only the physical function points were high ( $62.5 \pm 23.7$ ), while the scores were low in other subgroups. The lowest points were found for role-physical ( $28.5 \pm 33.2$ ), pain ( $33.2 \pm 18.7$ ) and role-emotional ( $34.5 \pm 38.8$ ) (Table 4). Aksungur, in his study, investigated the work satisfaction and life quality of midwives and nurses in one hospital. He found that physical function point, which is a subgroup of the SF-36 scale, was the highest ( $74.51 \pm 23.21$ ), and that the energy subgroup point was the lowest ( $50.16 \pm 20.48$ ) [16]. In our study, the subgroup point of physical function in life quality scale was lower than that of the study by Aksungur. Furthermore, other subgroup points were also lower. The literature showed that life quality perceptions of nurses who work in outpatient units are better than those of nurses working in services or intensive care units [28].

In our study, when we looked at the subscale points of nurses who came to the unit without any choice and who had satisfaction levels of "partially satisfied" or "not satisfied", it was found that they had low scores (Table 5). These findings suggest that the desire to work in a neonatology intensive care unit before starting to work there is very important. Similar to our study, it was found that there is a positive correlation between work satisfaction of nurses and life quality [29].

This research was performed with nurses who are members of the Neonatology Nursing Association and because of that the results cannot be generalized. Also, working conditions and physical environments can differ between institutes and health perceptions and satisfaction can be different between cultures. Furthermore, data about the effects on health care nurses are in their own words. Because of that, expressed health problems reflect each individual's own perceptions. Nevertheless, this study is the first in Turkey to investigate working conditions of neonatology nurses and the effects of these on their health and life quality.

## CONCLUSION

This research was made in order to determine the working conditions of neonatology nurses and the effects of these on their health and life quality. It was found that weekly working periods and working periods in each shift were high and that they examine too many neonates in each shift. It was stated by nurses that these effects and the low wages decrease work satisfaction in units. Most of the nurses expressed that their health was affected by working in the neonatal unit. Most of the problems expressed were weakness, fatigue and sleep problems. By using the SF-36 scale, it was found that nurses perceive their health conditions poorly with regard to physical, emotional role and pain aspects. When nurses make their own decision to work in the NICU and have high working satisfaction, their perception of health also increases.

According to these results, making legal and institutional arrangements regarding employee rights, including increased wages of neonatology nurses and decreased workloads and nurse-neonatal ratios are also important. As most of the nurses working in NICUs thought that their health was affected, it may be helpful to provide appropriate physical conditions in the working environment and perform periodic health reviews for nurses. Also, it is suggested that orienting individuals who have a desire to work in NICU units would be better as this can affect their health perception positively.

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## CONFLICT OF INTEREST

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