SHIFT WORK IMPACT TO SYMPTOMS OF ANXIETY, DEPRESSION AND SLEEP QUALITY AMONG NURSES

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Abstract. *Shift work is prevalent in service industries such as hospitals that provide 24-hour coverage. There is no common accepted definition of shift work, but usually shift work is defined as work hours that are scheduled outside daylight (6 am–6 pm) hours. Purpose of study is to compare quality of sleep, anxiety and depression among nurses working daily and shifts in Latvia. In this study 4 research tools were used: a demographic questionnaire, Beck depression survey (BDI), The State-Trait Anxiety Inventory (STAI) and Pittsburgh sleep quality index (PSQI). Research results showed that nurses in shifts have higher mean value scores than day time working nurses in all indicators – depression, anxiety and sleep quality. This research is meaningful due to the fact that it allows to acknowledge and evaluate the role of shift work on nurses health particularly on mood disorders and sleep quality.*
Keywords: shift work, nurses, depression, anxiety, sleep quality.

Introduction

Shift work is prevalent in service industries such as hospitals that provide 24-hour coverage. There is no common accepted definition of shift work, but usually shift work is defined as work hours that are scheduled outside daylight (6 am–6 pm) hours (Hughes & Stone, 2004). Shift work start times and lengths vary and may include working part or all of the evening (2 pm–12 am) or night (9 pm–8 am) (Alward et al., 1993). Shift-work assignments are classified as permanent or rotating.

Nowadays, many people are employed in shift and night work and this trend continues to grow. In fact, only about 25 % of workers in Europe have a regular day job. Also, nursing work is closely related to shift work (Parent-Thirion et al., 2007). Shift work is extremely dominant in the field of nursing and therefore there is belief in society that that is normal regimen for nurses.

Many studies have shown how the night shift and work during night hours affects health, for example, deterioration in the quality of work, reduction social activity. Such work schedules have been related to numerous health problems - cardiovascular diseases, digestive disorders, fatigue, cancer, depression/anxiety and sleep problems (Harma & Kecklund, 2010).

There are data that nurses shift work have influence and cause mental health problems and therefore can adversely affect patient safety (Tanaka, Otsubo, & Tanaka, M., 2010; Pei-Chen Lin et al., 2015).

Studies show that shift work could be a source of stress for nurses and researchers have identified that up to a 3 % chance of medical error can result from the stress associated with shift work (Rogers, 2008).

Nurses involved in shift work, who are at risk for decreased health and poor job performance resulting from stress, should be identified and changes should be made to reduce their stress and improve patient safety.

Many studies support the theory that night shift work may increase negative health risks for nurses. Some researchers suppose that the negative effects of long term night shift work may be affected by the circadian disruption, sleep deprivation, and melatonin suppression. This chronic disequilibrium may contribute to the negative health risks that appear to expand with the number of years of working on the night shift (Hughes, 2015).

Studies indicate that in comparison with nurses, who work day shifts, with those, who work rotating shifts or night shifts, were more eventually to have harmful physical and psychological health effects (Brown et al., 2009; Conway et al., 2008).

Purpose of study: To compare sleep quality, anxiety and depression among nurses working daily and shifts in Latvia.

Methods

In this study 4 research tools were used: a demographic questionnaire developed by the study authors, Beck depression survey (BDI) (Beck A. T. et al., 1988). Cronbach's alpha for Beck depression survey 0, 85; The State-Trait Anxiety Inventory (STAI) (Spielberger C. D. et al., 1970) and Pittsburgh sleep quality index (PSQI) (Buysse et al., 1989).

The BDI is a 21-item self-report instrument containing a four point scale for each item ranging from 0 to 3.

The STAI has 40 items, 20 items allocated to each of the Stait-Anxiety and Trait-Anxiety subscales. Responses for the S-Anxiety scale assess intensity of current feelings "at this moment": 1) not at all, 2) somewhat, 3) moderately so, 4) very much so. Responses for the T-Anxiety scale assess frequency of feelings "in general": 1) almost never, 2) sometimes, 3) often, 4) almost always.

PSQI has 19 items measure of sleep disturbance and usual sleep habits, with 0-3 Likert Scale ranging.

Results

The study included 103 nurses, full-time daywork (n 48) and shift work (n 55) employed nurses from Clinical Hospital. Respondents were aged from 23 – 72 years (M=51, 44; SD=8, 71). Sociodemographic data of study participants (n 103) can be assessed in Table 1.

Table 1 **Sociodemographic data of study participants (n =103)**

Variables	N	%
Age 18-30	7	6,8
46-55	40	38,8
56≤	22	21,4
Length of service		
0-5 years	9	8,7
6-10 years	6	5,8
11-15 years	15	14,6
15≤ years	73	70,9
Family status		
Married	39	37,9
Single	17	16,5
Cohabitant	14	13,6
Divorced	21	20,4
Widow	12	11,7
Education		
Professional secondary education	47	46,6
First level of higher education	17	16,5
Professional bachelor level	30	29,1
Master	6	5,8

Table 2 **Depression, Anxiety and Sleep quality index in study participants**

Variable	Mean (SD)
Depression (BDI)	8 (6,81)
State anxiety	35.81 (9,02)
Trait anxiety	38,04 (9,19)
Pittsburgh sleep quality index (PSQI)	4,98 (3,02)

Mean values of Depression, Anxiety and Sleep quality are shown in the Table 2. Depression mean value of study group nurses was 8, it is considered minimal range, as well as mean value State anxiety - 35.81 and mean value Trait

anxiety (38, 04) is seen as normal. It was found that Pittsburgh sleep quality index for this study group of nurses was 4, 98 – it's considered as of crossing point of norm.

Table 3 **Depression, Anxiety and Sleep quality index in study participants by age groups**

Age group	BDI* M ± SD	STAI** M ± SD	PSQI*** M±SD
18-30 years	6.71±4.23	67.29±13.79	4.86±1.77
31 – 45 years	6.29±5.97	70.31±16.69	3.94±2.56
46-55 years	11.33±7.16	79.63±16.81	5.50±3.23
56 and more years	8.82±6.80	70.86±18.53	5.68±3.28

*Beck depression survey; **The State-Trait Anxiety Inventory; ***Pittsburgh sleep quality index*

Depression, Anxiety and Sleep quality by the groups of age are shown in the Table 3. The mean values of the age group 46-55 years of nurses are higher than in other age groups.

The data of comparison of mean values of Depression, Anxiety and Sleep quality index in study participants by the type of work are presented in Table 3. Mean values show the differences depending on type of work, in all positions – Depression, State-Trait anxiety mean values and Pittsburgh sleep quality index are higher in the study participant group of shift work.

Mean values of Depression, Trait Anxiety and Pittsburgh sleep quality index of shift working nurses were higher that norm and these differences comparing the data with daily work study group were statistically significant (Table 4.)

Table 4 **Depression, Anxiety and Sleep quality index in study participants by the type of work**

	Full-time day work (n 48)		Shift work (n 55)		x^2/F
	M	SD	M	SD	
Beck depression survey	7,40	6,08	10,26	6,58	$X^2 = 10.11$; $p = .00^{**}$
State anxiety	33.8	8,55	37.51	9.14	$X^2 = 5,20$; $p = 0,74$
Trait Anxiety	35,75	1,30	43,26	8,72	F=3.6; p=0.02*
Pittsburgh Sleep Quality Index survey	3,91	2,26	6,16	3,86	$X^2 = 10.19$; $p = 0.01^{**}$

*P-value *<0.05 and **<0.01*

Discussion

Evaluation of the Beck depression questionnaire scores showed that the mean values of the survey was 8.00 (SD = 6.81). Achieved results in this study show that mean values are lower compared to other data obtained in Latvia in 2013 (Circenis, Millere, & Deklava, 2011)

It was found that there is a statistically significant difference between day and shift workers in BDI results. (X2 = 10.11, p = 0.00). The day working nurses BDI scores are lower than for shift work nurses. The mean value for day working nurses 7.40 (SD = 6.08), but for shift work nurses BDI values 10.26 (SD = 6.68).

The data from studies are different, for example, a group of authors in their work studied the effects of nurses shift work on depression, comparing to day working nurses. The results indicated that the shift work nurses had higher mean values of BDI scores with the mean of 13.25 (SD = 10.80), but the day working M = 9.94 (SD = 7.06) accordingly. Mean BDI scores are in general higher than in this study, but the difference between the average values can be seen as similar (2.86 and 3.31) (Halvani et al., 2012)

Another study results indicated that shift working nurses were not statistically significantly different in depression indicators in comparison with the daily working nurses (Selvi et al., 2010)

Analysis of data shows that there are statistically significant differences between different age groups in BDI mean values – in the age group of 46-55 years BDI scores were significantly higher. It is known that ageing may be associated with an advanced intolerance to shift work due to diminished psycho-physical fitness, the reduced restorative quality of sleep, and a higher proneness to the internal desynchronization of circadian rhythms (Costa, 2003). In turn no statistically significant difference was found between the groups of different levels of education and amount of working hours per month.

Evaluation of the results showed that Stait anxiety mean values were 35.81 (SD = 9.02), but Trait anxiety mean values accordingly 38.04 (SD = 9.19). Anxiety scores by age groups didn't showed statistically significant differences. Relatively higher mean values were in the age group 46-55 years both in Stait anxiety and Trait anxiety subscales (M = 38.20 and M = 41.43). It should be noted that there was found statistically significant difference in Trait anxiety subscale mean values in the different groups of work organization - in nurses group, who were working in shift work, the mean values of Trait anxiety subscale are higher than in nurses group who work daily - M = 43.26 (SD = 8.72) and M = 35.75 (SD = 1.30) accordingly. In the similar study authors found that shift working nurses also have higher Anxiety scores compared to daily working nurses (t = -2,384, p = 0.019) (Selvi et al., 2010)

Another study showed that shift work affects oxidative stress and anxiety symptoms in nurses, the researchers found that mean values of Anxiety for daily working and shift working nurses do not differ: M = 38.93 ± 6:07 daily working and M = 38.80 ± 5.30 shift working nurses (Ulas et al., 2012).

Evaluating the data of PSQI it was found that the mean value was 4.98 (SD = 3.02). Positive correlation (r = 0.34; p <0, 05) between the age of the respondents and sleep parameters was found. The highest rates were in the age group of 56 and more (M = 5.68, SD = 3.28). There is a statistically significant difference between daily and shift working nurses in PSQI results (p = 0.01). The daily working nurses PSQI scores were statistically significantly lower than in the group of shift workers. The daily working nurses PSQI results showed mean value 3.91 (SD = 2.26), but shift working nurses indicators were higher: M = 6.16 (SD = 3.86). Comparing our study results with other studies it was found that the data are different. A study revealed that PSQI average score for shift working nurses was 7 of 7 (SD = 2.60), but for daily working nurses mean value was 5.80 (SD = 2.80). The researchers concluded that shift work nurses compared to daily working nurses have a higher level of fatigue and worse sleep quality (Kunert, King, & Kolkhorst, 2007).

Shift work and with it associated health problems are important topic in healthcare, as its possible negative influence on professional's health and patient safety. The recognition of the mechanisms of shift-related problems could also be important to shift work planning (Saksvik, 2011).

It should be noted that adverse consequences for health and diminished quality of life at an individual level can result in remarkable employers' costs shifting employers, as well as increasing accidents and errors in health care (Emerson & Wickwire, 2017).

Several studies have shown that failure to gain appropriate sleep is a relevant contributor to medical errors, and a lack of sleep cause caregivers, including nurses, more predisposition to irritability and anger toward patients. This often convey to guilt, anxiety, depression, and even more sleep problems (Subhashni & Singh, 2010).

Conclusion

1. Shift work nurses are more depressed (according to BDI) than daily working nurses.
2. Nurses, who work in shift work, have higher anxiety traits than nurses, who work daily.
3. Shift work nurses compared to daily working nurses have a higher level of fatigue and worse sleep quality.

This research is meaningful due to the fact that it allows to acknowledge and evaluate the impact of shift work on nurse's health particularly on mood disorders and sleep quality. These findings suggest that we still need more studies to resolve some of the questions regarding the shift work effects on health.

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