Nurses' shift work: impact on health

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Abstract

Introduction: Work is important for the survival and personal attainment of individual people, but it also affects the lifestyle of people who are in the work process and leads to various health problems that employees are facing. Shift work and night work are associated with burnout, lack of personnel and lack of control effect on burnout, personal exhaustion, long working hours are associated also with excess body weight. Quality of life, tiredness, sickness, effectiveness and overall satisfaction with the work of nurses reflects the employer's sense for an appropriate time schedule, relaxation, psychological support and access to relaxation spaces. *Methods:* We used descriptive research method. We used the method of reviewing of the scientific literature based on accessibility, content relevance and actuality. We accessed it via an electronic link in the Celje Library. The restrictive criteria were the period January 2017 to April 2020, English language, availability for download, full text and scientific journals with the keywords "nurse", "shift work", "night shift" and "health" in the EBSCO and MEDLINE databases. The survey was conducted in April and May 2020. MS Word was used to display the results. *Results:* We have used, reviewed and processed 21 full-text articles for a review scientific article, after applying the inclusion criteria: nurse, working conditions, type of work, health link, type of publication, time period, language and availability of the full text, so 11 scientific articles are included in the final research. We found out that night work with many factors has a negative impact on the health of nurses. This is manifested as burnout, exhaustion, fatigue, depression, anxiety, concentration, chance for defects, back pain, poor eating habits, all of which have a profound effect on stress levels. The quality of sleep is also worse, the pattern of sleep is broken and insomnia increases. *Discussion and conclusions:* Findings show that nurses who work shifts and also do night work feel poorer quality of life, poor quality of sleep, higher

stress level at work, have less time for family, social contacts and physical activity and are more prone to overweight and development of chronic diseases. All this is of concern for the general well-being of nurses and their health. Employers should be able to well organize the shift work, rest days and the workload of nurses. This would make it easier to maintain, promote the good psychophysical status of nurses and increase healthy lifestyles and health levels of employed nurses through patient-centered examples.

Keywords: nurse, shift work, night shift, health

Introduction

Work is important for the survival and personal achievement of individual people, and at the same time work affects the lifestyle of people who are in the work process and leads to various health problems. (Ferriera dos Santos et al., 2018). The work of nurses takes place in shifts and cycles, it also includes a night shift, which usually means 12 hours, from evening to early morning. Schedules are poorly defined, include compulsory work, voluntary, forced, extended work and on-call time, and payments are poorly defined. During this time, the nurses have to work to combat their natural instincts, disrupting their natural circadian rhythm, which is regulated by natural light and darkness, resulting in lack of sleep and fatigue. Many nurses report exhaustion, extreme drowsiness during the workday, decreased attention, lack of sleep or long-term insomnia, as well as falling asleep during work. (Douglas, 2014, Antill, 2016, Wheatley, 2017). The so - called long working days, 12 - hour working days, bring less costs for the employer. Continuity of care increases, resulting in more injuries at work, reduced patient safety. Shift work and night work with overcrowding, lack of staff, lack of control, are associated with burnout and personality exhaustion. Some countries have already successfully regulated the work of nurses and the overtime they perform, and this is the right path to the well-being of nurses and their impact on their health. (Dall'ora et al., 2020a, Dall'ora et al., 2020b, Young, et al., 2018, Wheatley, 2017).

Hospitals are one of the most stressful environments where nurses are under the greatest impact. Either due to physical discomfort, psychological pressures, dysfunctional support of the work environment and negative social support of the work environment. The quality of life, fatigue, morbidity, effectiveness, and overall satisfaction with the work of nurses reflects the employer's attitude (Shamloo, Moradi, Hosseini, 2020). Nurses are the first line of health care that cares for the nation (Williams, 2017). They represent public health, and influence the patients and their families by example, indicating healthy lifestyle, eating habits and risk management. Excess body weight and obesity is markedly higher among nurses as the work environment for nurses is not conducive. The knowledge nurses have about a healthy lifestyle does not match their lifestyle. The health and satisfaction of employed nurses affects the work

and the organization in which they are employed (Ferriera dos Santos et al., 2018, Stanulewicz et al., 2020, Williams, 2017).

In the research project, we would like to present, investigate whether shift work affects the health of nurses, based on a literature review, literature search strategy and restrictive criteria. Research objectives:

- compare the findings of experts in research on the effects of shift work on the impact on the health of nurses,
- determine whether nurses detect changes during shift work,
- determine whether the impact of shift work on the health of nurses can be determined by measurements,
- describe the health effects of shift work.

Methods

The research was based on a descriptive research method. The scientific literature in the field of medicine was used in the research project. The selection of literature was based on accessibility, relevance and topicality, and innovative research was included, which supported its results with evidence. The literature was accessed via an electronic link in the Celje library. Material for the research paper was collected online in the databases EBSCO and MEDLINE, ProQuest and Google Scholar. In order to narrow the data, restrictive criteria were used: peer-reviewed articles, full text, year of publication for 2017 - 2020, language, if available for download, professional and scientific journals, with the keywords "nurse", "shift work", "Night shift" and "health". Search found 21 articles. Article review strategy: We have already excluded all articles online where there was no visible content, or they were in a language, other than English. A review of the databases gave us 21 results, after the review we eliminated 3 articles that did not contain basic criteria. The remaining 18 articles were read and reviewed, and 7 more articles were excluded according to the inclusion and exclusion criteria. The other 11 articles were included in the survey for the review article. The survey was conducted in April and May 2020. MS Word was used to display the results.

When searching for articles, we decided to include the inclusion and exclusion criteria shown in Table I. The inclusion criteria were that nurses or health professionals were involved, that working conditions were shift work or night work, that there was an impact on health, that the article was freely published in the period from January 2017 to January 2020 in English and accessible as full text.

Table 1: Inclusion and exclusion criteria

Criteria	Inclusion criteria	Exclusion criteria
Healthcare worker/nurse	Healthcare workers or nurses included	All other professions
Working conditions	Shift work/night shift work	Only day shifts
Impact on health	Present in text	Not present in text
Type of publications	scientific review, research articles	Other type of articles
Time period	January 2017 – April 2020	Older literature
Language	English language	All other languages

Results

Shift work can have detrimental effects on human health. In Table 2 the results of our research, which includes 11 articles, are shown. It lists the author, methodology, purpose, sample, and finding.

Table 2: Author, year and country, type of study, duration, and intervention, aim, environment and sample and results

	Author, year, and country	Type of study, duration, and intervention	Aim	Environment and sample	Results
1.	Hayashi et al., 2020 Japan	Questionnaire surveys 2x 1 year (2015 – 2016)	Investigate patient safety management system and activities and intention to participate in the second survey in relationship with working hours in a week, the number of night shifts in a month and the number of days off in a month	40 hospitals 100 healthcare workers	Long working hours, night, shifts and few days off, were associated with low patient safety culture
2.	Behrens et al., 2019 Germany	Psychomotor Vigilance Task (PVT) test bout at the end of two consecutive day and three consecutive night shifts, respectively. 3 years (2012 – 2015)	To mean reaction time, percentage of lapses and false starts	75 female employees working day and night shifts, 25 year or older, not pregnant or breast feeding within the last 6 months, not taking ovarian stimulation therapy, not have previous diagnosis of cancer	At the end of night shifts reaction times increased and number of lapses are higher compared to day shifts. Differences between in the number of false starts they didn't observe. Reaction times improved across consecutive day and night - shifts, frequency of lapses increased after the third night

	<i>Author, year, and country</i>	<i>Type of study, duration, and intervention</i>	<i>Aim</i>	<i>Environment and sample</i>	<i>Results</i>
3.	Fujii et al., 2019 Japan	Self - reported questionnaire 1 year (2015 – 2016)	If they have lower back pain in the last four weeks, and if it lasted for more than 3 months	12 hospitals 3,066 nurses (no lower back pain 1,265, with lower back pain 1,801)	Prevalence of lower back pain is high among Japanese nurses and interfered with their work. Fear avoidance beliefs about physical activity might be potential target for lower back pain management.
4.	Dehring et al., 2018 Australia	Cross – sectional study 1 year (2013)	Organisational climate factors and health outcomes differed across shift types	Two healthcare services in Melbourne 108 nursing staff	Organisational climate, focused on increasing supervisor support may mitigate the potential negative health outcomes experienced by shift workers
5.	Chatterjee, Saha, 2018 India	Quantitative and survey research	Mental health status and quality of sleep among nurses of critical and general ward	70 critical ward nurses 70 general ward nurses	No significant difference of two wards on mental health status, poor quality of sleep - in critical ward
6.	Owens, Moultrie, 2017 USA	On – line survey 2 weeks	Find out relationship between lack of sleep and the effects on Quality of Life, how shift work affects sleep patterns, correlation between the lack of sleep and nurse fatigue - related to long shift hours worked	138 nurses on day/night shifts	Shift work does affect sleep patterns and Quality of Life, nurses feel fatigued, when working long shifts as well as consecutive shifts and it also affect their sleep patterns.

	<i>Author, year, and country</i>	<i>Type of study, duration, and intervention</i>	<i>Aim</i>	<i>Environment and sample</i>	<i>Results</i>
7.	Dong et al., 2017 China	Cross – sectional study (Pittsburgh Sleep Quality Index (PSQI) – 20 - minute test 8 months (May – December 2015)	Determine the prevalence of sleep disturbances among clinical nurses measuring Quality of Life	5,012 clinical nurses - female	Sleep disturbances are highly prevalent among clinical nurses in general hospitals in China (female gender, ICU and Emergency Department, many years of service, high night shift frequency, professional status: primary and intermediate, employment status: temporary, poor Quality of Life: poor mental health, low perceived health, high occupational stress (high psychological demand, low job control, low workplace social support)
8.	Wickremaratne et al., 2017 Australia	Cross – sectional study 2 years (2006 – 2008)	Explore any association between colorectal cancer and rotating shift work in nurses and midwives	8,199 male and female nurses and midwives from Australia, New Zealand, and the United Kingdom	No significant association was found between rotating shift work and colorectal cancer in nurses and midwives
9.	Peplonska et al., 2017 Poland	Cross – sectional study Structured questionnaire 2 years (2008 – 2010) 1 year (2014 – 2015)	Rotating shift - work can be associated with the two tumours suppressors and DNA repair genes: BRCA1 and BRCA2	725 nurses and midwives (347 rotating night shifts, 363-day shifts, 40 – 60 years old)	No links between night shift work and BRCA1 and BRCA2 genes were observed. Smoking can contribute to epigenetic events

	<i>Author, year, and country</i>	<i>Type of study, duration, and intervention</i>	<i>Aim</i>	<i>Environment and sample</i>	<i>Results</i>
10.	Raskoden et al., 2017 Germany	7 days wearing multisensory accelerometer (SenseWear BodyMedia armband) and detailed food diary, measures physical activity (METs), Quality of sleep assessed by Pittsburgh Sleeping Quality Index (PSQI), and stress load using Trier Inventory for Chronic Stress Questionnaire (TICS)	Does working regular hours or rotating shift scan effect parameters of general health and nutrition (physical activity, sleep quality, metabolic activity, and stress levels)	46 volunteer participants of University Medical Department (23 rotating shifts, 21 non – shift regular hours)	Shift working had no influence on physical activity during working hours appears to be compensated for during off – hours. Nutritional status and stress level can effect on health – associated conditions
		1 year (2013 – 2014)			
11.	Chang et al., 2017 Taiwan	Cross – sectional study 1 year (2011) Questionnaire	Investigate the relationships between burnout and three components (emotional exhaustion, depersonalisation, and reduced personal achievement) of nursing professional commitment	571 nurses	Burnout was related to components of nursing professional commitment

Discussion and conclusions

Nurses face many challenges during their professional work. During the encounter of suffering, the relief of problems, pain, encounters with death, sometimes on a daily basis, poor wages, poor work organization, during stress and anxiety, schedules and shift work also bring their consequences. Behrens et al. (2019) and Lieberman et al. (2020) find that shift work affects the concentration of nurses, they sleep less, are exhausted, it also affects the number of work errors, prolongs reaction time by performing consecutive shift work or night shifts, while Hayashi et al. (2020) argues that patient safety is related to the number of working hours, night shifts, and lack of nurses' days off. Nurses who work at night may not be able to provide a high standard of care due to the organization due to the negative effects of fatigue on the quality of care and safety, also say Antill et al. (2016). Dehring et al. (2018) say nurses working shifts are more prone to distress, anxiety, insomnia, depression, and social dysfunction, but the organizational climate and increase in supervisors could alleviate

this. Catterjee and Saha (2018) claim that nurses working in the intensive care unit have poorer quality of sleep, while Owens and Moultrie (2017) find that shift work affects sleep quality, sleep patterns, quality of life, exhaustion with fewer family and social activities. Also Dong et al. (2017) argue that poor working conditions and shift work affect sleep disorders and high levels of occupational stress due to high psychological stress, low control over one's own work and poor social support of the work environment, which is reflected in poorer mental health and poorer general health. Douglas (2014) and Lieberman et al. (2020) similarly find that we humans have a natural need to sleep about 8 hours a night and that shift work, especially at night, has a bad effect on health, family and social life and, due to lack of concentration, can affect safety when driving home or to work. Raskoden et al. (2017) say that shift work has no effect on physical activity but has influences on eating habits and higher levels of stress. Härter Griep et al. (2014) found that night work was associated with excess body weight and obesity and that nurses would need strategies for a healthy lifestyle at night as well as a regulated diet in the workplace. Chang et al. (2017) they say that burnout has a negative connection with affectivity and norms of professional affiliation which are depersonalization, emotional exhaustion, and reduced chances of achievement. Fujii et al. (2019) found that lower back pain was associated with some nurses working in certain wards. As shift work has the potential to adversely affect the health and safety of nurses, organizations should ensure appropriate schedules through leadership and good management, which is a major challenge and a burning issue. Douglas (2014), and Wickremaratne et al. (2017) found in their study that there was no significant association between colorectal cancer and shift work of nurses and midwives, Shi et al. (2020) and Lieberman et al. (2020), on the contrary, found in their research that the risk of cancer and colorectal cancer is higher for nurses who work night shifts, especially for those who do such work for a long time. Pepłonska et al. (2017) notes that the study did not show an association between night shift work and tumor markers for breast and ovarian cancer. Trossman (2015) however, writes that in some states of America nurses are encouraged to go to rest or fall asleep briefly during night work, not to struggle with their circadian rhythm and not to disturb the biological clock, to be able to plan their own schedule, train attention, recognize fatigue, control sleep, and have education on balancing work and private life.

Organizations that employ nurses should, with good organization, careful scheduling, take care of the health of nurses, and at the same time take care to reduce errors for the benefit of patients. Nurses who take good care of their health, are aware of the risks of habits and take care of a healthy diet can be an example and good teachers to patients in the future. Many nurses perform shift work, including night shifts. Night shifts disturb the circadian rhythm of a person, which, with insufficient breaks and rest, leads to fatigue, overwork, burnout, bad mood, bad relationships at work, at home, and increases the risk of chronic diseases and even cancer. Night work is burdensome for nurses, the

longer they are exposed to it, the greater the risk to their health, professional attitude, the increased possibility of mistakes, and at the same time they work in a stressful environment where they have no support, sometimes social work relationships are broken. The health and satisfaction of nurses affects the work and the organization where they are employed.

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