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INTEGRATIVE REVIEW ARTICLE

NIGHT WORK AND ITS IMPACTS ON THE HEALTH OF THE NURSING TEAM: AN INTEGRATIVE REVIEW

O TRABALHO NOTURNO E SEUS IMPACTOS NA SAÚDE DA EQUIPE DE ENFERMAGEM: REVISÃO INTEGRATIVA

EL TRABAJO NOCTURNO Y SUS IMPACTOS EN LA SALUD DEL EQUIPO DE ENFERMERÍA: REVISIÓN INTEGRADORA

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ABSTRACT

Objective: analyzing the scientific evidences about changes in risk factors to the health of the night shift workers of the nursing staff. **Method:** an integrative review, from 23rd to 25th September 2013, in order to answer the guiding question << What impacts occur in the health of the nursing team active in night work? >> held in the databases PubMed/MEDLINE, LILACS and SciELO virtual library with 10 selected articles. **Results:** endocrine disorders, gastric and postural discomfort; hypertension, increased cholesterol levels, stress and changes in quality of sleep/rest; fatigue/ wear; reduction/absence of leisure time, family, social isolation and depression. **Conclusion:** the occupational nurse should focus on building the promotion, prevention and recovery of worker's health by the identification activities and reduction of health risk to this specific group, which has biological rhythm changes associated with the routine, the psychic need, social and economic of work. **Descriptors:** Night Work; Risk Factors; Quality of Life; Nursing.

RESUMO

Objetivo: analisar as evidências científicas sobre as alterações dos fatores de risco à saúde do trabalhador noturno da equipe de enfermagem. **Método:** revisão integrativa, no período de 23 a 25 de setembro de 2013, com vistas a responder a questão norteadora << Quais impactos ocorrem na saúde da equipe de enfermagem atuante no trabalho noturno? >> realizada nas bases de dados PUBMED/MEDLINE, LILACS e na biblioteca virtual SciELO com 10 artigos selecionados. **Resultados:** alterações endócrinas, desconforto gástrico e postural; hipertensão; aumento dos níveis de colesterol, estresse e alterações na qualidade de sono/repouso; cansaço/desgaste; diminuição/ausência de tempo para lazer, família, isolamento social e depressão. **Conclusão:** o enfermeiro do trabalho deve focar na construção da promoção, prevenção e recuperação da saúde do trabalhador, realizando atividades de identificação e redução de riscos à saúde desse grupo específico, que possui ritmo biológico alterado associado à rotina, a necessidade psíquica, social e econômica do trabalho. **Descritores:** Trabalho Noturno; Fatores de Risco; Qualidade de Vida; Enfermagem.

RESUMEN

Objetivo: analizar s evidencias científicas acerca de los cambios en los factores de riesgo para la salud de los trabajadores del turno de noche del personal de enfermería. **Método:** revisión integradora, del 23 al 25 septiembre de 2013, con el fin de responder a la pregunta guía << ¿Qué impactos se producen en la salud de las enfermeras activas en el trabajo nocturno? >> se celebra en las bases de datos PubMed/MEDLINE, LILACS y SciELO biblioteca virtual con 10 artículos seleccionados. **Resultados:** trastornos endocrinos, molestias gástricas y posturales; hipertensión; aumento de los niveles de colesterol, el estrés y los cambios en la calidad del sueño/repouso; fatiga/desgaste; reducción/ausencia de tiempo de ocio, la familia, el aislamiento social y la depresión. **Conclusión:** la enfermera del trabajo debe enfocarse en la construcción de la promoción, la prevención y la recuperación de la salud del trabajador, por actividades de identificación y reducción de riesgos para la salud de este grupo específico que tiene cambios de ritmo biológico asociados con la rutina, la necesidad psíquica, social y económica del trabajo. **Descritores:** Trabajo Nocturno; Factores de Riesgo; Calidad de Vida; Enfermería.

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INTRODUCTION

With the process of organization life in society associated with the Industrial Revolution and with the progress of artificial light, there were facilitators of the use of night work in order of an increasing need for demand of industrial products.¹

Work is force, time and skill that are sold for conditions of living, dressing, eating. As this was not enough, the work puts us in the social hierarchy of values, visible in the social prestige of certain professions other front. So work leads us to the possibilities of consumption, happiness, illness and death.²

Grounded by Brazilian law, the night work, the employee carries out its activities in a fixed shift that must occur from 22 hours until at least 5 am the next day. Despite recognizing the importance of night work for society and economic development, it becomes a disturbing bias by the way this work is organized and its implications for health professionals.^{3,4}

This shift requires the worker to recognizing its physical limits, for the execution of activities without interfering in health-disease, and not compromising the quality of care.⁵

The changes occur because the work performed in the night leads to situations requiring worker adjustment, since it undergoes a reversal of the sleep-wake cycle; there is thus a circadian rhythm disordering because the worker performs the activity at the time the organism prepares for the rest. The circadian rhythms are regular changes, with mental and physical characteristics that occur in the course of a day, and many of them are controlled by the biological clock located in the hypothalamus.⁵

Circadian rhythms are biological rhythms which vary around 24 hours and may be biochemical, physiological and behavioral events. These rhythms are controlled by external synchronizers as light, food, etc., but also persist without these environmental cues, which characterizes them as rhythms generated endogenously.⁵

The night shift has direct and indirect effects on health and the personal life of the individual. In fact, it forces the body to functioning in the physiological opposite direction that can lead to changes in work performance, with harmful consequences for the safety of workers, in addition to psychological and biological.^{4,5}

The night, in biological terms, is the moment in which the body prepares to renew

our energy. The night service workers have a psychophysiological wear greater than those who work during the day, because they work at the time when the body functions are diminished.⁴

From the point of view of human resources, attention to decreased quality of life, increased use of the health care system, decreased productivity in the workplace and increased the lead to increased absenteeism costs for businesses and society.⁶

Drawing attention to biological damage, increased back-related injuries related to obesity, including poor body mechanics resulting from not being able to hold heavy objects close to our body when lifting and overweight and obesity also impact productivity, performance, attendance and fitness at work.⁶

Regarding quality of life related to workers' health, it has acquired a significant dimension and according to the World Health Organization (WHO) defines it as "an individual's perception of their position in life in the context of culture and system of values in which they live and in relation to their goals, expectations, standards and concerns".⁷

By the above, comes to the concern for workers' health in night service, emerging as general objective: to performing an integrative review in order to increase knowledge of the impact of nocturnal activity in health and quality of life in nursing team. However, they have developed the following objectives:

- Identifying scientific evidences on changes in risk factors to the health of night shift workers of the nursing staff;
- Discussing the impact of night work activity on workers' quality of life.

METHOD

A descriptive study of an integrative review, aiming to gather and synthesize results of research on a particular topic in a systematic and orderly manner, with a tool that favors the deepening of knowledge on the subject researched, the synthesis of several published studies and general conclusions about a particular area of study.⁸

From 23rd to 25th September, 2013, there was held to review from the databases Biomedical Literature Citations and Abstracts (PubMed/MEDLINE); Latin American and Caribbean Health Sciences (LILACS) and virtual library Scientific Electronic Library Online (SciELO).

In order to list the studies to answer the research question and the inclusion criteria,

elaborated a questionnaire with open questions.

The descriptors in Health Sciences (DECS) employees to search the studies in LILACS and SciELO were: Night work; Risk factors; Nursing; Quality of life; used separately and in combination. We chose Boolean and as it acts as the word "and" operator, displaying only articles containing all descriptors typed by limiting the amplitude of the research.

For PUBMED/MEDLINE, the following descriptors of Medical Subject Headings (Mesh) were used: Shift Work; Risk Factors; Nursing; Quality of Life. In order to better quality in searches used the strategy "PEAK", as follows: P - defines a population, clinical situation or problem; I - set an intervention; C - add a comparison; the - describe a clinical outcome. This structure is highly

recommended by the movement of Evidence Based Medicine (EBM).⁹⁻¹¹

There were established the inclusion criteria: Language in English, Spanish and Portuguese; smaller publication period than five years; articles in full texts that addressed the influence of night work on changes in modifiable risk factors and associated with the improvement of the night worker quality of life in the nursing team. Regarding the exclusion criteria: theses and dissertations.

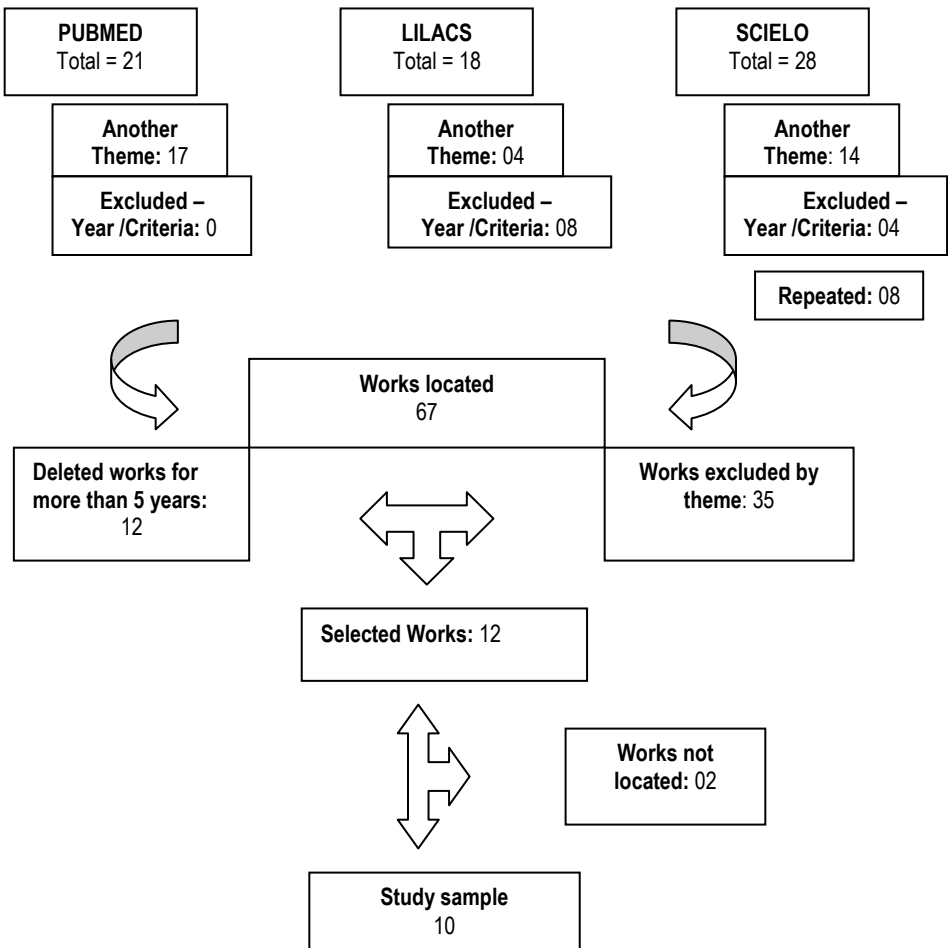
Than made up the initial sample of articles in PubMed base (31,34%), LILACS (26,86%) and SCIELO (41,80%), shown in Table 1, which were read all the titles and abstracts found. Excluding all surveys that were not really adapted to any of the aforementioned inclusion criteria, 67 studies were highlighted.

Table 1. Search result of selected terms in electronic databases/virtual library, Rio de Janeiro, 2013. Drafted by the authors.

Databases/Virtual Library	n	%
PUBMED/MEDLINE	21	31,34
LILACS	18	26,86
SCIELO	28	41,80
Total	67	100,00

From this pre-established sample, there were excluded 18% of the scientific works to be earlier publications to 2009, the research that had different thematic approach amounted to 52%, we observed 12% of repeated publications and at the end we

selected 18% of the studies to build sample. After reading in full and rigorous pre-selected articles, two articles were not found, totaling ten scientific researches, being the final sample flowchart (1).



Flowchart 1. Elaboration of the stages of general analysis of the groundwork of the study. Drafted by the authors.

Based on the collection it was possible to ensure with all the relevant data extraction, minimizing the risk of transcription errors, ensuring accuracy in checking the information and served as registry to verify the existing production on the subject.

We highlighted the presentation of ten scientific publications, of which 05 (50,00%) were categorized into risk factors to the health of night shift workers of the nursing staff and 05 (50,00%) in quality of life related to night work activity in nursing.

Considering the profession of the authors, totaling 39 (100,00%) authors, we observed 28 (71,79%) nurses or nursing students, 9 (23,08%) were referred to doctors, academics or residents of the area and two researchers from other areas such as Dermatology. Emphasizing each category, the authors repeated not quantified in the analysis of the subject in risk factors to the health of night shift workers of the nursing staff, it is observed that 11 (53,40%) were nurses researchers, 8 (38,10%) the medical field, 2 (9,50%) from other areas. Regarding the quality of life related to theme night work

activity in nursing, 17 (94,40%) were nurses and 1 (5,60%) medical author.

Looking at the country and the language of each scientific work, we found 7 (70%) works produced in Brazil, 3 (30%) in the US. Highlighting each category: in production on the risk factors, there were 3 (60%) in Brazil, 2 (40%) in the US. Already in production on the quality of life: 04 (80%) in Brazil and 1 (20%) in the US.

Respecting the inclusion criteria, we analyze the language of each scientific work, where we found: 6 (60%) recorded in Portuguese and 4 (40%) in English.

Of the ten studies included in the research, 3 (30%) were produced by a methodology of systematic review and 7 (70%) by retrospective cohort with qualitative and quantitative approach.

Scientific activities were organized by the database, and are evaluated on their quality in line with a model of level of evidence¹², illustrated in the tables below.

Base/virtual library	Authors	Country / Year	Method	Results	Level of evidence
PUBMED	Feskanich, D Hankinson, SE Schernhammer, ES.	USA/2010	Observational study with quantitative approach and analysis of multivariate relative risk of fracture over different lengths of follow-up in relation to years of night work.	Compared with women who never worked on the night shift, more than 20 years of night work was associated with a significantly increased risk of hip and wrist over eight years. (RR = 1.37, 95% confidence interval [CI] 1.04, - 1.80). This risk was stronger among women with a lower BMI (< 24) who have never used hormone replacement therapy (RR = 2.36, 95% CI 1.33 -4.20). The elevated risk was apparent not with twelve years of evaluation work at night. Long periods of night work can contribute to the risk of hip and wrist fractures, although the potential for	Level 2

				inexplicable confusion cannot be dropped.	
PUBMED	Zapka, M Lemon, SC Magner, RP Hale, J.	USA/2010	Quantitative study, with analysis of anthropometric measurements and weight of nurses from six hospitals in Massachusetts. Characteristics of the work included several years at the hospital, hours worked per week, working a second job, change, perceived work stress and the hospital environment, and overall job satisfaction.	The initial sample was comprised of 405 employees, 49 judged excluded. However, the 356 only 194 consented to participate. Regarding BMI, 28% were classified as obese and 37% overweight. As the ideal or underweight. The difference was significant for those who perceive; If being a little overweight (P = 0.03), and was marginally significant to those who perceive to be very overweight (P = 0.08). Respondents who had BMI ≥ 30 or reported being very overweight reported significantly less those who work more than 36 hours a week ate a lower percentage of calories.	Level 2
PUBMED	Sfreddo, C Fuchs, SC Merlo, AR Fuchs, FD.	Brazil/2010	In a cross-sectional study, assessed the association between shift work and blood pressure, Prehypertension. In total, 493 nurses, nursing assistants and technicians, were randomly selected in a large general hospital setting and hypertension.	The average age of participants was 88.2, and 34.369.4% were women. Workers on the night shift were older, often married or divorced, and less educated. The prevalence of hypertension in the entire sample was 16% and 28% had pre-hypertension. Blood pressure (after adjusting for confounding factors) was not different among workers in shifts, day and night. The prevalence of hypertension and Prehypertension,	Level 2

				shift work was no different in univariate analysis (RR = 1.0)	
SCIELO	Izu, M Cortez, EA Valente, GV Silvino, ZR.	Brazil/2011	This is a descriptive and exploratory study with a qualitative approach, where bibliographic data were collected from the Virtual Health Library (VHL), Medline, LILACS, and SciELO. 10 sample articles.	Result: night work may be a risk factor in the onset of breast cancer, endometrial, colon, demonstrated through epidemiological studies. In addition, the change in circadian rhythm by exposure to light during the night can be a factor for several diseases such as cardiovascular, gastric disorders in sleep and cancer. The deregulation of the circadian rhythm can change the delicate balance among the factors promoters and inhibitors of cell division.	Level 5
SCIELO	Silva, RM Beck, CLC Magnago, TSBS Tavares, JP et all.	Brazil/2011	This is a descriptive and exploratory research, conducted in the period of March, 2008 at the University Hospital of Santa Maria /RS.	The results showed that 27 nurses perceive changes in health as poor quality sleep/sleep, tiredness/fatigue, among others. On the other hand, there is the convenience of working at night to continue his studies or the possibility of reconciling the second job.	Level 2

Figure 1. Studies included in the category of health risk factors the nightworker nursing team. Niteroi, 2013. Prepared by the authors.

Base/virtual library	Authors	Country / Year	Method	Results	Level of evidence
PUBMED	Wenqing, LI Qureshi, AA Schernhammer, ES Han, J.	USA/2012	Prospective studies, the nurses' health study (SNS) (1988-2008) and of SUS II (1989 - 2005).	In Nurses' Health Study (NHS), 58.8% reported working in night shifts rotation for at least one year, with 10.9% reporting ≥ 10 years of rotation of night work. In NHS II, 61.6% reported already working rotating night shifts, with 4.5% for ≥ 10 years. In both groups, those who already work in rotating night shifts tend to have a higher BMI were more likely to be physically active or current smokers. Were identified cases of psoriasis 1,887 General incidents during follow-up. Compared with those who did not report any night work, those already working rotating night shifts at the beginning of the study had a significantly increased risk of psoriasis. Other parity adjustments, use of postmenopausal hormones, depression, personal history of psoriasis co-morbidities, as well as sleep and snoring frequency (only for NHS) does not significantly change the results.	Level 2
LILACS	Silva, AA Rote Nberg, L Fischer, FM.	Brazil/2011	A cross-sectional study with a qualitative approach held at University Hospital in the city of São Paulo, between 2004 and 2005. 696 employees participated (from nursing staff), predominantly women (87.8%) who worked in day shifts and/or nocturnal.	Be the only responsible for household income, the night work and the effort-reward imbalance were the only variables associated with both the professional journey (OR = 3.38; Or = 10.43; Or = 2.07, respectively) for	Level 2

			Fulfillment questionnaire on sociodemographic data applied and a Generic Questionnaire of evaluation of quality of life and Ability to work.	the total journey (OR = 1.57; Or = 3.37; Or = 2.75, respectively). None of the variables related to workload associated with significantly low index of Ability for the job. Insufficient time for home proved to be statistically associated with the professional days (OR = 2.47) and total (OR = 1.48). Insufficient time for leisure was significantly associated with the professional journey (OR = 1.58) and borderline value for the total journey (OR = 1.43).	
LILACS	Silva, RM Beck, CLC Guido, LA Lautert, L Tavares, JP Prestes, FC Rocha, L.	Brazil/2009	Semi-structured interview, with a qualitative approach.	The sample was composed of 42 nurses female (90.48%), with predominant age group more than 41 years of age (64.28%) and who have opted for a night's work (90.48%) empirical categories: quieter work environment; interactions between nursing staff; greater availability of time for private life; night work as a possibility of greater autonomy and night work as a possibility of qualification of nursing care. Statements related to social isolation at work and nurse wear caused by the realization of night work.	Level 2
LILACS	Neves, MJAO Branquinho, NCSS Paranaguái, TTB Barbosa, MS, et all.	Brazil/2009	Study of qualitative approach. The sample of 16 nurses that used a screenplay with guiding questions relating to nurses ' understanding about what it means to quality of life, their	The results indicated a relationship between the ability to work and the quality of life, and this related to basic needs such as health care, housing,	Level 2

			reasons for opting for the night period and about the influence of night work in their quality of life.	recreation, work and decent remuneration.	
LILACS	Silva, C Martino, M.	Brazil/2009	Descriptive study with quantitative approach.	The investigated sample was composed by 53 of 69 nurses, being 13 the day shift, 18 and 22 night's rampage. Of the 16 subjects who did not take part (23.2%). The results revealed that the nurses of the morning period would wake up early, but not anticipated the sleep schedule; the sleep of the nurses of the evening period suffered no changes; the night time nurses presented daytime sleep short and split time; emotional profile of nurses suffered changes during the shift..	Level 2

Figure 2. Studies included in the category quality of life related to labor activity at night nursing. Niteroi, 2013. Prepared by the authors.

RESULTS

The analysis of 10 studies of the sample enabled and synthesized the knowledge of national and international literature about the risk factors to health and quality of life both associated with the implementation of the nocturnal activity of the nursing team.

With regard to risk factors, night work entails undeniable effects on health, both in the physical part, the mental, emotional and social, given that the employee has his social life and organic rhythm linked to the day, or wake up the morning with sunshine and sleeping at night, when the sun sets. The organic function is related directly with the circadian cycle, with example we can mention the body temperature, corticosteroids and serum electrolytes and urinary, cardiovascular functions, secretion of gastric enzyme, number of white blood cells, muscle strength, alertness, humor, immediate memory and long-term.¹³

Thus, all authors related to the theme raised negative consequences, where epidemiological studies have provided evidences on changes resistance to cancer,

which is complemented by the immune, endocrine and antioxidant processes, which influence on breast cancer onset, endometrial and colon, and argue that a dysregulation of circadian rhythm can modify the promoting factors and cell division inhibitors.¹³

In a study that evaluated postmenopausal women, osteoporosis and night work, where 1,223 nurses were followed for 25 years (1988-2000) by the Nurses' Health Study, demonstrate that the risk for osteoporosis-related fractures, probably linked through melatonin pathway, showed elevated levels in women who worked for more than 20 years at night and are compatible with future disruptions of the display effect at night light.¹⁴

Emphasizing exposure to artificial light at night, it was subsequently linked with decreased levels of melatonin in human circulation and increasing the risk of cancer and other serious diseases, epidemiological authors raised, significant data in 2012, with a sample of 1,989 women nurses, in a prospective cohort study, the relationship of nocturnal activity, for more than 10 years, with the risk of developing psoriasis.¹⁵

Optimizing the data presented, the losses were most often cited in surveys: changes in weight gain, gastric and postural discomfort, and lack of exercise, high blood pressure, increased cholesterol levels, high levels of stress, aging, and changes in sleep quality/rest; fatigue and wear.

A research conducted with 194 nurses, with a quantitative approach, from anthropometric measurements and weight, in 2010, with a population of 92,6% of women, achieved significant numbers for obesity (65,4%), hypertension (13,6%), smoking (4,9%), abnormal cholesterol (21,5%). Poor diet and the neglect of food quality may be related to the ingestion of easy to prepare foods with low nutritional value, allowing the appearance of digestive disorders, such as imbalance in the secretion and gastrointestinal motility, which can cause heartburn, appetite disorders, difficulties in digestion, constipation, and flatulence in shift workers compared to the daytime.^{5,16}

Weight gain can also be one of the consequences of the impossibility for the practice of physical activity, especially the day after the night shift. This may be related to the influence of sleep and tiredness/physical and mental strain of the worker.⁵

The researcher witnessed in nursing workers, who worked in the Intensive Care Unit on the night shift in a field investigation of research, in 2011, with descriptive and quantitative approach, with a population of 66 members of the nursing team during the shifts, there was eating pizza, burger, chips, chocolate and biscuits cakes excess, several times during the period of duty. The most frequent period of these facts was between midnight and three in the morning, a time when there is a decline in organic metabolism and justified by the workers as a strategy to inhibit sleep.⁵

In line with the evidence of the nursing population that perform the evening activities that are active smokers, hypertensive, dyslipidemic, sedentary and tend to have a BMI (Body Mass Index) greater than expected, authors emphasize the risk of these individuals to evolve due endothelial injury smoking and increased oxidation of high density lipids associated with the stress factor, are susceptible to cardiovascular diseases, which are the main causes of death in the world today.^{17,18}

The nurse's work has the opportunity to influence the choices to improve health habits, which would facilitate a healthier lifestyle, especially in aspects of nutrition and

physical activity. Such changes provide an increase in the potential of productivity and quality of life.

The results observed in the category of quality of life the night employee of the nursing team emerged insufficient time for leisure, reinforcing that this is an indirect association with total working hours. In nursing, the injuries from these immediate outcomes are, for example, musculoskeletal disorders, mental, exhaustion and fatigue, sleep deprivation and insomnia, lack of time complaints with family.¹⁹

Authors evidenced reports of social isolation, where social relations are affected by holding positions in the night; so, while they work, the other people sleep, meet with the family to celebrate holidays and important dates.²⁰

There are coexistence of difficulties with family and friends, apart from the relative lack of access to courses or other regular appointments, walking to social isolation. Various aspects of social and family life may facilitate or hinder their day-to-day, acting; therefore, as important factors in the process of tolerance to the employment scheme.²¹

Given these that are reinforced by a descriptive and quantitative research approach, as 23 members of the nursing team in 2009, where the group nighttime nursing was a prevalence of workers with higher ages. The age favors a progressive intolerance to shift work, as is generally associated with instability of circadian rhythms, sleep disturbances, depression and a decline in physical function and health.²²

Emotional changes that can wear are related to care activity, where the work at night disrupts the body changing habits making the team more vulnerable to mood swings, were more irritable, decreases the ability of concentration and reflexes.^{22,23}

In nursing, the quality of life directly influences the personal and professional life of the team. Linked to several criteria, including self-esteem and well-being, quality of life is influenced by socioeconomic level, emotion, social interaction, self-care, family assistance, health status, cultural, ethical values and even religious.^{23,24}

The quality of life of nursing workers is a result of contradictions between healthy and protective aspects that this group enjoys and the destructive aspects that suffers, as its historical and specific insertion in the production of health. Thus, highlights the dialectic and contradictory relationship between life and work and between

potencialization of life through work, although exhausting.²⁵

CONCLUSION

Scientific researches highlighted in this work providing harmful health awareness in the performance of night work; however, it is a sine qua non in the effectiveness of assistance in any area, whether hospital or at home, not having to be removed.

Although we do not find research on purpose to modify the night service arrangements, one should seek a balance by adopting measures to reducing health impact and improving safety at work of employees of the night. Individual strategies and/or collective, the level of reduction of working hours, invest in improving working conditions, medical, psychological and nutritional counseling, among others, can minimize the damage discussed in this study.

Nurses' work should focus on construction of promotion, prevention and recovery worker health by the identification activities and health risk reduction of this specific group, which has a biological rhythm changes associated with routine, the psychic need, social and economic work.

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