

The effect of shiftwork on sleep quality among hospital staff in Bandarabbas

Marzieh Hosseini¹, Abdolhamid Tajvar², Hadi Eshaghi Sani³, Einollah Hosseinpour roudani¹

1) BSc .Student of public health , student research committee , Hormozgan University of Medical Sciences , Bandar Abbas, Iran

2) Department of Occupational Health ,faculty of health, Hormozgan University of Medical Sciences , Bandar Abbas, Iran

Corresponding authors, Email: omid.tajvar@gmail.com

3) Assistant professor of occupational medicine , medicine collage , Hormozgan University of Medical Sciences , Bandar Abbas, Iran

Introduction:

sleep problems are prevalent currently and involve deficits in quality or quantity of sleep . Todays by the rapid growth in technology and a high increase the production of industrial complexes and also inauguration round-the-clock centers such as hospitals, shiftwork has become an indispensable part of many occupational activities. This study aimed to evaluate the association between shiftwork and sleep quality.

Material and methods: this cross-sectional descriptive study was conducted on 307 employed personnel of Hormozgan University of medical sciences hospitals who worked at unusual hours. All of the samples were randomly collected by proportional cluster sampling method .all individuals were evaluated using the demographic form and Pittsburg sleep quality questionnaire. Data analysis was done by spss 16 (descriptive statistics and spearman test) and p.value<0.05 showed the relationships .

Results: the mean scores of sleep quality in participants was 10.03 ± 6.37 , the participants included 78 male and 229 female who consist of 252 nurses and 55 doctors . the mean score of sleeping was beneficially in relation with occupation , sleeping duration , sexuality and qualified sleeping (p.value : $p<0/006$, $p<0/05$, $p<0/001$, $p<0/002$)

Conclusion: voluntary selected work flow system could increase the job satisfaction and increase satisfaction can reduce the consequences of shift work.

Key words: shift work, sleep quality, disturbed sleep, hospital

Introduction:

Sleep is the most important circadian cycle and complex biological model. Sleep and wake cycle is one of the biological cycle that is affected by physiological performance, lightness and darkness, work program and other actions. Different evaluations showed that more than 50% of nurses involved with acute sleep problems that is a risk factor for their health, social actions and family responsibilities such as pregnancy, children training and etc. . also working in different shifts could have other bad effects on work performance, physical health, psychic health, social life, using different drugs and rate of tolerating work stress.[1-3] also

shiftwork or work in unusual hours that is more used in industrials and services organisms is one fatally achievement of technology gain and is number for one of the harmful work factors because of its bad effects on different feature of human life [4]. Shiftwork is an unusual model for working besides day working. Shiftwork personnel is called to all personnel that works in unusual hours (usual hours is between 7 am to 6 pm) into fix or rotatory [5-6] . different type of shiftwork include : fix shifts that person usually work in 1 shift like night work , rotatory shifts that person work in different shifts and work hours are unplanned , on call shifts that is special types of shiftwork that special group of personnel will be called for doing their duties in

emergency cases . but the most useful shift mechanism is the mechanism that service product is set in 8 hours shifts and repute to day shift , evening shift and night shift [7].statistics show that in 2 recently decades number of persons in America that worked into shiftwork between men was 22% and between women was 16% . And in most of European country this quantity from 12.5% in 1954 was increased to 25% in 1968 . in other report in 2001 near 0.2% of all over the world work into shiftwork and this statistics in undeveloped countries is under increasing [7,4]. Today's by the rapid growth in technology and a high increase the production of industrial complexes and also inauguration round-the-clock centers such as hospitals, shiftwork has become a indispensable part of many occupational activities. Although shift work in past was a type of work that included a few member of labors but now it numbers a common type of work program that could have unwelcome effect on human life quality . However today's shift work is necessary but for those who busy with this type of work have some injuries [8] . Shift work is cause for decreasing performance, long time encounter with poison composite, changing in nutrition habits, increasing tiredness and sleeplessness , health disorder , personal and social life disorders , and etc between shift workers. According to this that shift work has short time and longtime effect , the short time effects of that include : effect on circadian and performance and immune rhythm , overlap with social and family life and longtime effects include : digestion problems , heart disease and etc . Combination of sleeplessness and work, is a weak point that can be cause of tiredness and feel sleepy that this issue can be cause of making tiredness in concentration and method of doing works and increase the accidents [5,6,9-11] . investigations introduce the shift work as a tense agent and researchers believe that shift work's stress increase the risk of mental disease among depression.[12] also shift work increase the job risks and sudden and high risks accidents.[13] researches show that prevalent problem of those who works in industrials and health-care places and etc into shift work are sleep disorder . each adult person require 7-7.5 hours in each 24 hours and even some person requires 9hours for complete awakening ; but the mean of a night worker's sleep is 4-6 hours that shows 5-20% decrease in sleep degree in these

persons or after night shifts with day workers. Night work program indicate that person while work in night have the maximum concentration for working with high quality and also requires enough time for sleep in day instead of night awakening . Incidentally we can't replace the day sleep with night sleep in these persons qualitatively and also shift work is cause for hardness in sleeping or interrupt the sleeping [14]. It is remarkable that some of jobs allocate sometimes for shift work personnel to sleep or feed that researches show that allocating some hours however short to sleep while work at night help to improve sleeplessness and proficiency and even effects on reducing risks and accidents specially that risk and making accident in terminal hours of work at night is more because of more tiredness. [9] according to emphasis that say about shift work and according that human resource are the most important job resources and the bad effect of shiftwork on these resources , we proceed to evaluation of shiftwork effects on sleep quality in this study

Material & methods:

This cross-sectional descriptive study was done to evaluate the relationship between shiftwork and sleep quality of nurses and doctors of educational hospitals of Bandar Abbas in 1394 . Society of this study was shiftwork personnel of Hormozgan university of medical sciences in 1394-95 . Sample size considering to statistics counsellor and other studies and according to

$$n = \frac{(z_{1-\alpha/2})^2 * p(1-p)}{d^2}$$

was 400 of shiftwork personnel of Hormozgan University of medical sciences. Method of sampling was scale classification that included 2 class of doctors and nurses that sample of each class according to the number of them that sequentially was 300 & 1200 sample size in each class was 80 & 320 sequentially . for gathering data was gone to Hormozgan university of medical sciences hospitals and in different shifts (evening & night shifts) and was asked from personnel to complete the questionnaire and finally the doctors and nurses who works into shiftwork and they response to our questionnaire completely were

included in and those who didn't do were excluded to our study .

the research instrument was Pittsburg questionnaire that its validity and reliability was confirmed in Bather's study . the questionnaire in first part included the demographic questions such as age , sex and etc. and then specific sleep quality question that include 19 items and it will be core by a 4 grade Likert spectrum from 0 – 3 and the final score varies between 0 – 39 and , getting higher scores shows the less quality of sleeping . in the other word if the final score be 39 , it shows the worst sleep quality and 0 shows the best sleep quality . this questionnaire have 7 sub measure that include : 1) subjective sleep quality , 2) sleep latency ,3) sleep duration ,4) habitual sleep efficiency 5) sleep disturbances ,6) use of sleeping medication ,7)daytime dysfunction. Data analysis was done by spss 16 (descriptive statistics and spearman test) and p.value<0.05 showed the relationships.

Results:

From 400 questionnaire, 90 questionnaire because of non-cooperating were excluded and at least analysis was conducted on 310 sample. Average of people was 30 ± 9.54 and 82% of them were nurse & 18% were doctor. 25.4% were men & 74.6% were women. Time limit for sleeping was between 0 – 60 minutes

Table 1 : the average of sleep score for shift workers according to effectual sleep in month

	Effectual sleep in moth	Number of people	Average of sleep score
1	90 – 160	69	12.50±7.03
2	160 – 230	184	9.27±6.01
3	230 – 300	54	9.44±6.01

Table 2 : average of effectual sleep in month & average of sleep score according to sex :

and into average was 30 minutes. Average of sleep score for men was 8.82 ± 5.78 and for women was 10.44 ± 6.53 , in the other hand men have a better sleep quality than women ($p < 0.006$) . Average of effectual sleep of shift- workers in month was 193.36 ± 6.53 and into statistics this was in relationship with average of sleep score ($p < 0.006$) and also the average of sleep score was in relation with age ($p < 0.02$)

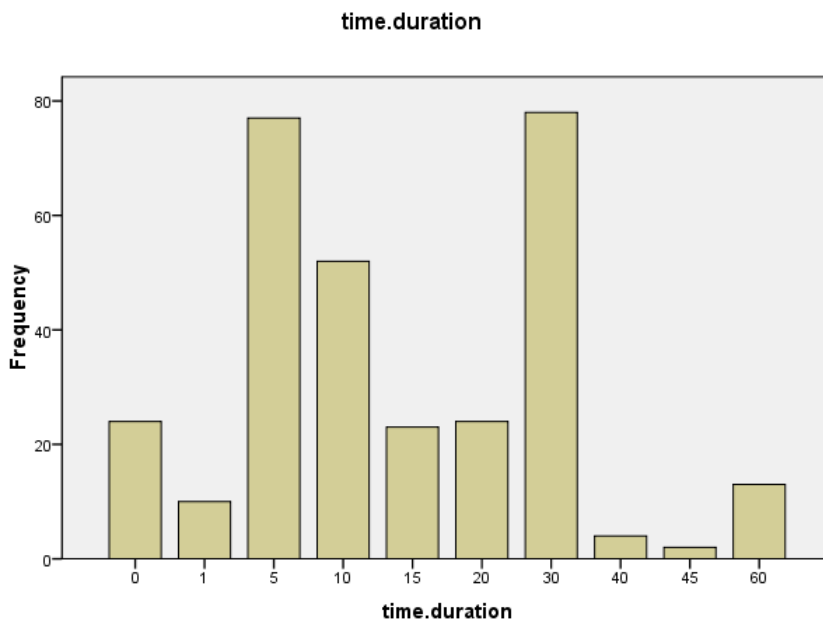
The average of sleep score according to the effectual sleep in month was showed in table 1 & table 2 and 3 sequentially have showed average of effectual sleep in month according to sex and job. average of sleep score for those who were sleeping between 10-12 pm was 9.20 ± 5.81 and for those who were sleeping between 1- 3 am was 11.69 ± 7.13 that have statistics different, in the other hand people who were in group number 2 had lower sleep quality ($p < 0.001$) average of sleep score in nurses was 10.55 ± 6.40 and in doctors 7.63 ± 5.71 and in the other hand doctors had better sleep quality ($p < 0.002$) . Average of sleep quality in people was in relation with job, sleep hour and effectual sleep in month and was not in relation with other things .

	Sex	Number of people	Effectual sleep in moth	Average of sleep score
1	male	78	198.14±37.56	8.82±5.78
2	female	229	193.25±46.16	10.44±6.53

Table 3 : average of effectual sleep in month & average of sleep score according to job :

	job	Number of people	Effectual sleep in moth	Average of sleep score
1	nurse	252	193.49±46.75	10.55±6.40
2	doctor	55	199.09±29.12	7.63±5.71

Chart 1 : this chart shows that how much time takes for sleeping and its between 0-60 minutes .



Discussion :

In this study sleep quality in nurses and doctors was checked. Sleep quality in both group had disorder and the average of sleep score in people was in relation with job and sleep hour and effectual sleep of people in month. in Haram's and co-workers sleep quality was in relation with age that is similar to our study but hour of shiftwork was not checked in our study [15].

In in our study sleep quality of nurses had the worst situation than doctors, in dr.Rahimpour study 66% of nurses had low sleep quality that is similar to our study [16]. In retrospectively study that done by Mohammadi high percentage of nurses had low sleep quality that is similar to our study [17].

In Perruccis study despite that sleep disorder in shiftwork group was more than other but alcohol usage was checked too that it was not checked in our study and was eliminate as an error agent [18].

In Hanhart and co-workers study duration of shiftwork and rest hours was known as the more danger for sleep quality disorder that was not checked in our study [19]. Sleep quality in Takahashi and co-workers showed that all nurses had unwelcome sleep quality that is similar with our study[20].in Karagozogu study in turkey that reported low sleep quality was similar to our study too [21].

Conclusion:

According to this study sleep quality disorder in shiftwork people was define clearly. this study had some limits such as few sample sizing and from other way this study was done into cross – section because of that we can't found causality relationship and we offer a providential study with high sample size.

Resources:

1. bagheri, h., et al., *relationship between sleep quality and life quality of nurses*. hayat, 2007. **12**(4): p. 13-20.persian
2. poorfar, f., et al., *the relationship between sleep quality and public health of shifwork nurses*. periodical of occupational, 2011. **4**(4):(p. 8-13.persian
3. admi, H., et al., *shift work in nursing : is it really a riskfactor for nurses " health and patient " safty ?* nursing economics 2008. **26**(4): p. 250-257.persian
4. nezamodini, z., et al., *the relationship between shiftwork and public health and sleep quality in personnel of a pipe producing company*. the journal of promoting immunity and prevention of strickens, 2015. **2**(3): p. 189-195.persian
5. zamanian, z., et al., *an investigation of shift work disorders in security personnel of 3 hospital of shiraz university of medical sciences*. iran occupational health 2009. **9**(1): p. 52-57.persian
6. balghanabadi, s., m. pour, and h. dehghan, *the relationship between shiftwork , fatigue and sleepness and accidents among workers in sugar factory*. journal of occupational hygiene engineering, 2015. **1**(3): p. 45-52.persian
7. mardi, h., et al., *a case study in the security personnel of a refinery complex*. journal of ergonomics 2014. **2**(1): p. 46-53.persian
8. heidari, m. and s. hosseinoor, *the effect of shiftwork on mariage effetivness*.

- quarterly of search house, 2006. **2**(8): p. 342-354.persian
9. choobine, a., et al., *the evaluation of shiftssworking problems in serjical technolojists of shiraz medical sciences hospital*. iran occupational health, 2007. **4**(1& 2): p. 48-52.persian
10. Åkerstedt, T., *Shift work and disturbed sleep/wakefulness*. Occupational Medicine, 2003. **53**(2): p. 89-94.persian
11. barger, l.k., s.w. lockley, and s.m.w. rajaratnam, *neurobehavioral , health , and safty consequences associated with shiftwork in safty - sensitive professions*. curr neurol neurosci rep, 2009. **9**(2): p. 155-164.persian
12. mahmoodi, s. and k. zehni, *the comparison of depression prevalence between shiftwork nurses in education hospital of kurdestan medical sciences univercity*. nusing search, 2014. **8**(28): p. 29-38.persian
13. poordehghan ,m., a. danesh, and h. esmaeli, *the impression of nurses works and blood pressure while shift working*. attitude and performance, 2007. **11**(1): p. 81-88.persian
14. mirmohammadi, s.j., et al., *the relationship between shiftworking and sleepness in nurses*. periodical of occupational, 2012. **3**(2): p. 31-38.persian
15. Harma M, Sallinen M, Ranta R. The effect of an irregular shift system on sleepiness at work in train drivers and rail way traffic controllers. *Jornal of sleep Research*. 2002; **11**(2): 141-151
16. Rahim-pour F, Mohammadi S. Tasire Bikhabi Bar Salamate omumie parastaran. *Proceedings of the 5th National congress on Sleep Disorders; 2011 Tehran, Iran*. Persian
17. PourSamad A, Mohammadi M. Moruri Bar Motaleate Anjam Gerefte Dar Zamineye Ekhtelalate KHabe Parastaran. *Proceedings of the 5the National congress on Sleep Disorders; 2011 Tehran,Iran*.Persian
18. Perruccis CJ, Evans GR. Effect of a change in shift work on Health. *Occup Med Jornal* 1993; **43**(3): 167-8
19. Hannhart B, Adam A, Chourthia H. Rotating shift work schedule on quality of life and sleep in shift workers. *Williams & Wilkins, Inc*. 2006; **17**(6): 513-521.
20. Takahashi M, Fukuda H, Miki K, et al. Shift work-related problems in 16-h night shift nurses: Effects on subjective symptoms, physical activity, heart rate and sleep. *Ind Health*. 1999; **37**(2): 228-36
21. Karagozoglu s, Bingol N. Sleep quality and job satisfaction of Turkish nurses. *Nurs Outlook* . 2008; **56**(6): 298-307