

## Research

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# Perception of Fatigue in Female Nurses Employed in Hospitals

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## ABSTRACT

**Background:** Fatigue is the inability to maintain the required stamina in work capacity with consequences affecting occupational performance, health, and safety. Women are often more exposed to the risk of fatigue because they tend to be multitaskers. The present survey is aimed at determining the perceived fatigue in female nurses employed in hospitals and identifying the individual and occupational factors affecting it.

**Methods:** This survey was conducted on 270 female nurses. The sample was selected using multistage randomized stratified multistage sampling. To collect the data, a demographic and occupational information, and Iowa Fatigue Scale (IFS) were filled using the self-report technique. The gleaned data were analyzed with SPSS16 using analysis of variance (ANOVA), T-test and, and Pearson correlation coefficient.

**Results:** The overall score of nurses fatigue was 30.78±7.90. There was a statistically significant difference between employment status ( $p=0.01$ ), husband's support ( $p=0.00$ ), age ( $p=0.008$ ), and work experience ( $p=0.02$ ) on one hand, and fatigue. There was no significant difference between marital status ( $p=0.23$ ), type of ward ( $p=0.59$ ), official position ( $p=0.51$ ), work shift ( $p=0.29$ ), having a suckling ( $p=0.10$ ), having a second job (0.25), and monthly work hours ( $p=0.38$ ) and fatigue.

**Conclusion:** Based on the findings of this survey, a moderate degree of fatigue was observed among female nurses employed in clinical wards. Also, factors such as age, being married, employment status, and husband's support have considerable impact on the perceived fatigue. This demands the application of preventive interventions to decrease fatigue in female nurses specifically for older married nurses with permanent employment.

**KEYWORDS:** Fatigue; Nurses; Women's health.

**ABBREVIATIONS:** IFS: Iowa Fatigue Scale; ANOVA: Analysis of variance; LSD: Least Significant Difference.

## INTRODUCTION

Fatigue is described as a state of drowsiness which originates from the physiological mechanisms related to sleep and circadian rhythm affecting the individual's response to psychosomatic needs.<sup>1</sup> This state usually results from physical and spiritual disorders, stress, and overworks.<sup>2</sup> That is why fatigue is also defined as the inability to maintain and preserve the required or expected stamina and energy or the lack of energy in the working capacity.<sup>3</sup> Working with fatigue is even equated to alcoholism.<sup>4</sup>

The nursing profession is among those jobs in which the staff works in various work shifts.<sup>5</sup> Individuals who work in the night shift in circulating rounds are exposed to lack of sleep<sup>6</sup> which is associated with increasing fatigue.<sup>5</sup> This exerts detrimental effects on the nurses health,<sup>7</sup> linked to dysfunction in the physical and cognitive performance of persons.<sup>8</sup> The con-

sequences of this dysfunction influence the individuals occupational and organizational performance, and affect their health.<sup>9</sup> The consequences of fatigue include reduced memory, reduced reaction time, decreased speed of information processing, irritability, endangering of problem solving and critical thinking, slipping in paying attention to details, decreased concentration, judgment, and motivation.<sup>4</sup> Also, regarding the point that fatigue is associated with serious damage to the nursing staff including muscular-skeletal and cardiovascular damages, etc.,<sup>9,10</sup> on the whole, fatigue may lead to reduced output, dissatisfaction, absence from work, increased sick leave, and high turnover of the personnel<sup>11-13</sup> enhancing the decision for leaving the occupation.<sup>5</sup> All these affect the nursing planning and implementation of effective nursing interventions<sup>14</sup> leading to the emergence of treatment errors and resulting in negative health-care consequences. Since the nurses are in charge of the safety of their patients, factors such as long work hours and exhaustion are threatening the patients safety.<sup>15</sup>

Indeed, the shortage of nurses is a global problem and it is mandatory to pay special attention to the challenges and problems within their work environment that nurses face. In other words, issues related to work stress and psychologic factors such as weariness, depreciation, and burnout should be given prompt and sufficient attention. Besides, provision of psychological health in the work environment is an important strategy for keeping nurses interested and improving the nursing environment.<sup>13</sup> The working ability is a dynamic process which is constantly changing in the course of life. It is the result of interactions between manpower and work characteristics and can be maintained and even repaired *via* implementing the necessary interventions required for promoting health and prevention of fatigue.<sup>11</sup>

The present evidence does not provide any specific sources for fatigue in the work environment<sup>9,10</sup> as the concept of fatigue is a multi-factorial one.<sup>13</sup> Nonetheless, some hypothesis have been presented indicating the association between fatigue and circadian rhythm, quantity and quality of sleep, personal hygiene, work environment and duties, long work hours, insufficient rest, excessive stress, or a combination of these.<sup>9,10</sup> According to studies based on different populations, the prevalence of fatigue is about 10-45%, with women being 1.5 times more at the risk of fatigue<sup>15</sup> and prevalence of compassion fatigue in nursing is 7.3% and 40%.<sup>16</sup> The number of female personnel in health professions is more than men. On the other hand, in addition to occupational responsibilities, women handle other duties such as childbirth, raising children, and managing the home environments which demand sustaining more stressful situations. This reminds us of the increased risk in women and demands more attention to the phenomenon of fatigue in them.<sup>17,18</sup> On the other hand, medical errors and employee injuries are serious challenges in the healthcare system. Fatigue in nursing has been linked to both of these factors.<sup>19</sup> However, their own reactions have not been systematically addressed.<sup>20</sup> Furthermore, stresses may vary across healthcare work environments resulting

in varying levels of fatigue across contexts, and little emphasis has been placed on the potential health consequences for nurses providing care.<sup>21</sup>

Finally, the phenomenon of fatigue lacks clarity.<sup>20</sup> Considering the point that nurses, specially female nurses, are exposed to various psycho-somatic stressors interfering with their working ability and functioning as the cause of fatigue, some research aiming at analyzing the factors related to insufficient working ability and understanding their perceived fatigue is mandatory.<sup>11</sup> To develop a positive constructive work environment, it is further vital to obtain a better understanding of the degree to which nurses and other health-care providers are affected by conditions such as fatigue, burnout, and weariness.<sup>13</sup> Identification of nurses specific needs based on their demographic and occupational characteristics can be helpful in developing appropriate programs aimed at reducing fatigue. The findings of these programs may be applied in improving the nurses personal hygiene, stress management strategies, and development of fatigue management.<sup>9</sup>

The present survey focused on determining the perceived fatigue in female nurses and identifying the individual and occupational factors affecting this fatigue so that some appropriate measures could be taken to reduce fatigue in nurses through the exact identification of those factors. In this way, the quality of nursing care could be promoted and the nursing errors may be decreased.

## METHODS

The present survey was a cross-sectional study conducted on the female nurses employed in the clinical wards of the teaching hospitals of Yazd, Central Iran, 2014. Sampling was done using the stratified multistage sampling method. To do so, first the hospitals were considered as strata. Then, a specific share (ratio) proportional to the sample volume was given to each hospital with regard to the percentage of the female employed nurses at that hospital compared to the total number of nurses in all hospitals. It should be mentioned that all the wards in each hospital were taken into account and the nurses in each ward were selected randomly based on the list of personnel and proportional to the number of the female nurses employed in that ward. Sample volume was estimated to be 270 nurses regarding the previous studies,<sup>22</sup> the sample's attrition rate of 15% and considering the prevalence rate of 18%, accuracy of 5%, and confidence level of 95%.

$$n = \frac{z^2 \cdot p(1-p)}{d^2} = \frac{(1/96)^2 \times 0.18 \times 0.82}{(0.05)^2} = 226$$

The inclusion criteria were: being female, holding at least a Bachelor of Sciences (BS) in nursing, full-time employment in a hospital, and at least one-year work experience. In the case that the nurses were not inclined to participate in the study, they were excluded from the survey. A two-part questionnaire

was used to cull the data. The first part included demographic information such as age, marital status, having a suckling, and husband's support. The second part contained occupational parameters including work experience, work hours per month, post of duty, type of work shift (round), employment status, and having a second job. To investigate the rate of fatigue, the Iowa Fatigue Scale (IFS) was used which studied the degree of fatigue over the past month. This scale included 11 items each with a score ranging from 1 to 5 (never, a little, moderate, much, very much). This scale has been derived from integration and condensation of many of the available scales on fatigue. It has been proved to be a useful valid clinical instrument for screening and monitoring chronic fatigue.<sup>23</sup>

Generally speaking, a score between the ranges of 30-39 indicates the presence of considerable fatigue and a score of 40+ reveals severe fatigue. Hence, the cut-off point for a fatigued nurse was the one who scored 30+ on this scale. To establish the validity and reliability of this instrument, the recommended Forward-Backward method was used and the translated version was approved through consultation with three English language PhD's and psychologists.

Then, it was tested in a pilot study. The reliability of the questionnaire was  $r=0.82$  using test-retest reliability coefficient on 20 nurses within 2 weeks. Also, Cronbach  $\alpha$  was used to estimate the internal consistency coefficient of the items in the instrument which was 0.70. To carry out the survey, the researchers presented to the nurses in person in their working shift and the research procedures and objectives were explained to them. Having obtained their informed written consent, they were given the questionnaire and they completed it using self-report technique and handed it to the researcher during their next work round. The data were collected and analyzed using SPSS16 *via* descriptive and inferential statistics of independent T-test and one-way analysis of variance (ANOVA) and, Pearson correlation coefficient.

## RESULTS

All the nurses participating in the survey completed the questionnaire and handed it to the researchers, so, the return rate of the questionnaire was 100% indicating the high importance of the issue for the female nurses. In fact, they were highly anxious about their fatigue to be reflected to the related authorities. The statistical findings pertaining to individual and occupational characteristics revealed that the mean and standard deviation (SD) of nurses age was  $32.63\pm 6.301$  years, working experience  $9.15\pm 6.262$  years, and work hours  $184.81\pm 26.698$  h/month. Furthermore, regarding marital status, most female nurses (218, 80.7%) were married, most (153, 56.7%) were formally or permanently employed, most (252, 93.3%) held the post of a nurse, most (231, 85.6%) had circulating shifts, 12 nurses (4.4%) had a second job, and 59 nurses (21.9%) had a baby. The overall mean of nurses fatigue was  $30.78\pm 7.90$ . Independent T-test showed that there was a statistically significant difference between mean

and SD of fatigue in permanent and temporary employment ( $p=0.01$ ). Also, ANOVA revealed that there was a significant difference between mean and SD of fatigue at various levels of husband's support ( $p=0.000$ ). Furthermore, using least significant difference (LSD) test, it was demonstrated that there was a significant difference between no support and little support (0.013), no support and much support (0.026), little support and much support (0.000) and moderate support and much support (0.000). Nevertheless, independent T-test showed that there was no statistically significant difference between mean and SD of fatigue between the married and single nurses ( $p=0.23$ ), special and non-special wards ( $p=0.59$ ), head nurse and nurse ( $p=0.51$ ), fixed morning shift and circulating shift ( $p=0.21$ ), having or not having a baby ( $p=0.10$ ), and having or not having a second job ( $p=0.25$ ) (Table 1). Based on data analysis, Pearson correlation coefficient demonstrated that there was a significant difference between the mean and SD of "fatigue and age" (0.008), and "fatigue and work experience" (0.02); however, there was no significant difference between the mean and SD of fatigue and work hours per month (0.38) (Table 2).

## DISCUSSION

Our findings indicated that fatigue was higher than the cut-off point in the "considerable fatigue interval" among the female nurses employed in the clinical wards of the teaching hospitals of Yazd, Central Iran. Similar, studies also report moderate to severe fatigue among nurses. According to other study, nurses experience high rates of fatigue.<sup>24</sup> Besides, researchers reported that nurses in special wards experienced high levels of compassion fatigue.<sup>25</sup> In the study by Amaducci and colleagues,<sup>26</sup> 83.5% of the nursing students had moderate to severe fatigue with varying range of effects on the activities of daily living (ADL), the main cause being academic activities. Since individual's life style, culture, and organizational policies affect the prevalence and severity of work fatigue, and the prevention of work fatigue demands multi-dimensional approaches including involvement of the organization, clinical unit, and the individual,<sup>24</sup> developing support systems for nurses with fatigue and burnout is rendered as mandatory.<sup>27</sup>

Consequently, the managers of the health system of the country should take some appropriate measures to remove the material and spiritual shortcomings and deficiencies present in the system that induces fatigue in the employees. Indeed, in a study, sleep and recreation are the most important strategies for reducing fatigue.<sup>26</sup> Researchers offer aerobic exercises and sports to manage physical fatigue and mental burnout.<sup>28</sup> Strategies such as risk management education in continuous medical education programs have been recommended for reducing fatigue.<sup>17</sup> Hence, regarding the prevalence of fatigue among nurses, the predisposing factors should be considered meticulously. Also, both work environment variables and organizational factors (work conditions, interpersonal interactions in the work milieu, satisfaction, and occupational safety) and external variables out of the work environment must be taken into account with

Demographic and Occupational Variables	No.	Percentage	Mean	SD	T-test	
Marital Status	Single	52	19.3	29.60	8.612	T=1.23 P=0.23
	Married	218	80.7	31.06	7.721	
Employment Status	Permanent	153	56.7	31.81	7.471	T=2.47 P=0.01
	Temporary	117	43.3	29.43	8.278	
Type of Ward	General	181	67.0	30.60	8.243	T=0.53 P=0.59
	Special	89	33.0	31.15	7.199	
Post of Duty	Head nurse	18	6.7	29.61	6.482	T=0.64 P=0.51
	Nurse	252	93.3	30.86	8.001	
Work Shift	Fixed Morning	39	14.4	30.57	8.019	T=1.04 P=0.29
	Circulating	231	85.6	32.00	7.164	
Having a Suckling	Yes	59	21.9	32.27	8.310	T=1.64 P=0.1
	No	211	78.1	30.36	7.757	
Second Job	Yes	12	4.4	30.90	7.891	T=1.13 P=0.25
	No	258	95.6	28.25	8.114	
Husband's Support	Never	66	24.4	35.41	7.176	F=7.238 P=0.000
	Little	22	8.1	31.93	7.065	
	Moderate	107	39.6	30.71	8.693	
	Much	75	27.8	27.83	7.584	

Table 1: Comparison of mean and SD of fatigue in terms of demographic and occupational variables.

Demographic and Occupational Variables	Mean	SD	Correlation coefficient	p-value
Age	32.63	6.301	0.162	0.008
Work hour/month	184.64	26.595	0.054	0.38
Work experience	9.15	6.262	0.135	0.02

Table 2: Correlation coefficient between nurses fatigue score and demographic and occupational variables.

sufficient scrutiny.<sup>27</sup> In addition, other researcher recommends the analysis of effective variables and organizational factors related to fatigue.<sup>17</sup>

Moreover, the findings of our study regarding the correlation between fatigue and individual's traits demonstrated that fatigue was more prevalent in the married female nurses compared to the singles which was an expected result as married women have the occupational responsibility added to the familial duties. However, the difference was not significant. According to Sahebi and Ayatollahi,<sup>29</sup> marital status, i.e., married, single, divorced, or dead, had no correlation with mental health. Yet, being single was correlated with nurses vulnerability to occupational burnout in Spain.<sup>25</sup> It should be mentioned that most marriages in Iran occur below the age of 25 years increasing the vulnerability of married women. Based on our findings, there was a significant positive correlation between age and fatigue. In other words, younger individuals suffered less from fatigue and the perceived fatigue increased with age. This is because with increasing age, the expectations of satisfaction with work

increases while the physical and psychological ability decreases. So, if the satisfaction is not achieved, more fatigue will be perceived.

Tanaka and colleagues<sup>30</sup> cite that age is directly correlated with fatigue. Furthermore, the age of 30+ was associated with vulnerability to occupational burnout in Spanish nurses.<sup>25</sup> Nonetheless, Amaducci and colleagues<sup>26</sup> assert that there is a negative correlation between age and fatigue, as older individuals are more compatible with facing new situations and suffer from fatigue to a lesser degree. Also, nurses with a suckling perceived fatigue more compared to those without a suckling indicating that caring for a suckling leads to increased perceived fatigue due to the demand for the responsibility of the suckling care, though of course the correlation was not significant. As Sahebi and Ayatollahi<sup>29</sup> declare, there was no association between number of children and mental health. The findings of this study showed that nurses who enjoyed their husband's support, perceived less fatigue. Nurses without any husband support perceived the most fatigue, those with little husband support per-

ceived moderate fatigue, and those with much husband support perceived the least fatigue. There was a significant correlation between fatigue and husband's support. Peters and colleagues<sup>31</sup> recommend the study of home and familial characteristics as an effective predictor of health consequences in nurses. Social support exerts a positive effect on fatigue and burnout.<sup>32</sup> However, the findings of the study by other researcher are inconsistent with these results as unexpectedly they found no correlation between fatigue and individual's life partner.<sup>26</sup> Of course, they studied fatigue in nursing students which are different from our participants who were female nurses mostly married. In this case, the nurses life partner, specially their spouses, play a significant role in feeling less fatigue through spiritual support and even providing occupational facilities and essentials for their wives occupation.

Our findings regarding the association between fatigue and work traits revealed that fatigue was more prevalent in women whose employment status was guaranteed compared to those with temporary employment without any warranty and the difference between the 2 was significant. This may be due to the fact that the employed nurses knew that they should work for long years and tolerate hard work for that time to achieve a stable guaranteed occupational status, i.e., they needed a longer work experience. These factors caused the older nurses to perceive more fatigue compared to the younger ones with temporary employment. There was a significant positive correlation between fatigue and work experience so that nurses with longer work experience perceived more fatigue. There was a correlation between a work experiences longer than 10 years and nurses vulnerability to occupational burnout.<sup>25</sup> Hence, researchers introduce work experience as an important criterion in selecting the target group for implementing the required interventions to increase work stress coping skills.<sup>13</sup>

Regarding type of ward/unit, nurses were employed in special wards perceived fatigue more than those in general wards as they dealt with very ill in-patients who needed more intensive care. This caused them more fatigue, yet, the difference was not significant. Therefore, it is inferred that the severity of fatigue is also considerable in general wards and, on the whole, the clinical setting brings about fatigue in nurses due to type of activities and nursing care. Regarding post of duty, staff nurses felt more fatigue than head nurses. This may be due to the point that the head nurses have a fixed morning shift with a more regular work program. Besides, they are more involved in managerial than clinical affairs, so, they perceive less fatigue. Yet, the correlation was not significant. As for work shift, the women employed in fixed morning shift perceived less fatigue than those with circulating shift. As a rule of thumb, nurses with a circulating shift report more fatigue due to reasons such as irregular circadian rhythm, insomnia and insufficient sleep, etc., yet, the association between the two was not significant. Sahebi and Ayatollahi<sup>29</sup> report no correlation between work shift and mental health. However, Palhars and coworkers<sup>33</sup> reports no association between work shift type and experience of disease and sleep quality among the par-

ticipants, also Punja and colleagues<sup>10</sup> cite that individuals with circulating shifts experience fatigue by 19-29% while fatigue may be aggravated by increased sequential shifts and working for more than four 12-hour shifts.<sup>34</sup> Additionally, work shifts longer than 12 h are linked to increased fatigue and error.<sup>24</sup> Nurses working in 12-hour shifts get more drowsy and fatigue.<sup>35</sup> Female nurses with a second job other than nursing or those who worked as a nurse in several places perceived more fatigue compared to those with only one work shift, yet, the correlation was not significant. According to Zamanian and coworker<sup>36</sup> increased work load from the previous years has led to extensive fatigue among nurses. With regard to the relationship between work hours and fatigue, nurses with less work hours felt less fatigue while those with longer work hours or overwork reported more fatigue. Of course, it should be mentioned that work hours in Iran is 44 h/week. This was the mean work hour of the nurses under study indicating the obligation for working extra hours, yet, the correlation was not significant. In this respect, Sahebi and Ayatollahi<sup>29</sup> assert that long work hours are not correlated with mental and psychological health. In any case, the researchers recommend reducing work hours among the hospital personnel as a useful strategy for protecting nurses health.<sup>37</sup>

## CONCLUSION

Based on the findings of the present study, female nurses employed in the clinical wards of teaching hospitals perceive considerable fatigue. Factors that show a significant correlation with fatigue include older age, being married, formal or permanent employment, and husband's little support. These demands more prompt interventions to improve the status of the female nurses with the above-mentioned condition. Overall, it is recommended that special attention be given to nurses general health and to the prevention of fatigue in female nurses by providing free leisure time activities and recreation, increased occupational support, and provision of consultation services. The 100% return of the questionnaires was one of the strong points of this survey. One of the limitations of this survey was that the participants education level was not studied as a variable since most of the nurses under study held a BS in nursing; so, a comparison of different educational levels was not possible. Moreover, as the concept of fatigue is multi-factorial, it was not plausible to investigate all the factors affecting it in one single questionnaire. This requires further research. It is also advisable to focus future research on elucidating the effects of strategies used to remove nurses fatigue.

## CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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