

## Research Article

# Prevalence of Neck Pain in Hospital Secretaries and Impact of Disability on Psychological State and Quality of Life

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## Abstract

**Objectives:** The primary purpose of our study is to compare the frequency of neck pain in hospital secretaries working in sitting position with a control group of similar age and gender. Our second purpose is to investigate the relation between neck pain and disability in hospital secretaries and psychological status and quality of life.

**Material and Methods:** 100 female hospital secretaries and 100 housewives with no regular job for at least 2 years aged between 20-55 years were included in this study. After demographic characteristics of the participants were recorded, Visual Analogue Scale (VAS), Neck Disability Index (NDI), Short Form-36(SF-36), Hospital Anxiety and Depression Scale (HADS) forms were filled. This data was compared between hospitals secretaries and unemployed women. In addition, relationships between total working time and neck pain, disability, quality of life and psychological state in secretaries were examined.

**Results:** It was observed that hospital secretaries had high scores in all VAS, NDI and HADS scales with respect to housewives. They had significantly lower scores for SF-36 physical functioning, vitality, social functioning, mental health and mental components. A significant correlation was found between pain severity and disability and between pain severity and physical function, social functioning and physical component scores from SF-36 sub-scores in hospital secretaries. A significant correlation was found between total working time of secretaries and duration of pain and disability.

**Conclusion:** Hospital secretaries are at risk in terms of neck pain, disability, anxiety and depression. Preventive measures should be taken to increase productivity of work and employee welfare.

**Keywords:** Neck pain; Hospital secretary; Computer user; Ergonomic

## Introduction

Neck pain is a common problem [1], and 60-70% of the population in developed countries complain of this pain at least once in their life [2]. Generally, it is more frequently observed in women [3]. Neck pain leads to a serious loss of labour and economic losses [4], similar to back pain. It can lead to functional limitations and disability due to its negative effects on activities of daily living. The main objective of treatment is correction of functional status of the patient. To increase therapeutic success, factors that have effects on functional status should be well-known [5]. One of these factors is bad posture. Millions of people around the world work at a table and the relationship between musculoskeletal complaints and bad sitting posture of these employees provides inspiration to researchers [6]. Rapid advances in industry especially in the last 20 years and technological progresses have created the problem of Work-related Musculoskeletal Disorders (WMSD) in office employees who operate computers. WMSD is defined as injury or disease of muscles, nerves, tendons, joints, cartilage and spinal disc which develop as a result of risk factors in the work environment [7]. These disorders primarily

affect the neck and upper extremities, with lesser effects on back and waist regions. As a result of these negative influences, employee productivity is reduced, high labour loss emerges and both labour forces and treatment costs are negatively affected [8]. As chronic pain is a complex concept which develops on a multifactorial basis, clinical evaluation as well as information on psychological factors, demographic factors and economic status of patients can also help clinicians [5]. Some studies have shown that psychological factors are associated with neck pain in both acute and chronic phase. Cognitive factors, anxiety, depression and emotional status were found to be associated with pain and disability and they are recognized as risk factors [9]. We have not found a study on the frequency of neck pain hospital secretaries, investigating their psychologic status, quality of life and disability. Our aim in this study was to compare the frequency of neck pain in healthy individuals and hospital secretaries working beside a table, along with their duration of employment and postural disturbances, and to investigate the relationships between psychological status, quality of life, disability and neck pain in hospital secretaries.

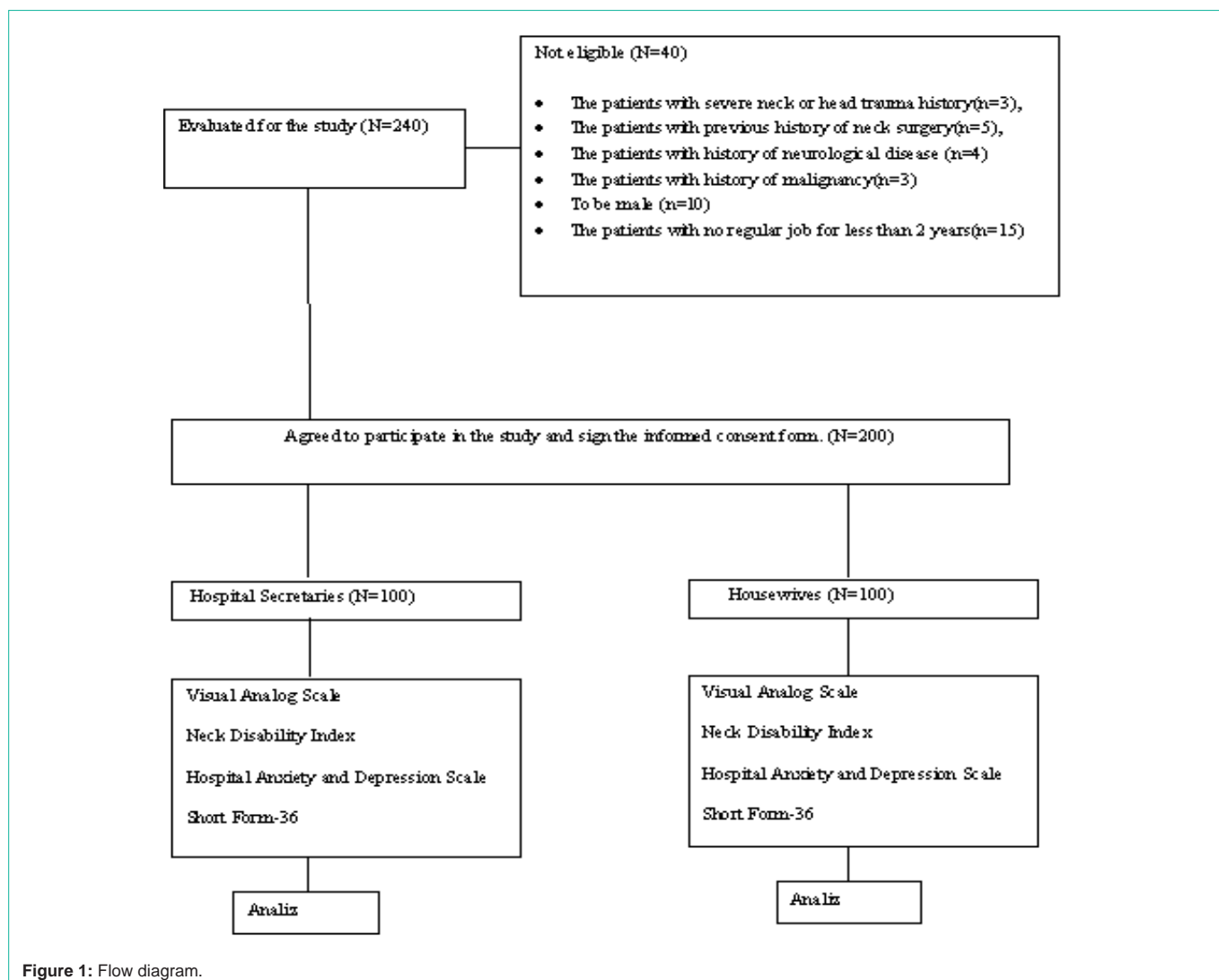


Figure 1: Flow diagram.

## Material and Methods

### Patients

100 female hospital secretaries aged between 20-55 years and 100 housewives with no regular job for at least 2 years were included in this study. Inclusion criteria for the study were as follows: female hospital secretaries who work actively and females with no regular job for at least 2 years. Patients with a history of serious neck or head trauma, neck surgery, a neurological disease, or malignancy, who were diagnosed to have depression and anxiety and medically treated, were excluded from the study. Our study received approval from the local ethics committee with a decision number of 2014/09/05 on 30 April 2014. First of all, informed consent forms were signed by all participants, after they were thoroughly informed in detail regarding the study. All secretaries included in this study were working at the same hospital. Housewives who were friends of these secretaries who consented to participate in this study were included in the control group. All forms were filled by a secretary who was kept blind on the study. Demographic characteristics of all subjects were recorded. Duration of employment at the same workplace was recorded as months for hospital secretaries. The duration of pain was recorded

for all participants (Figure 1).

### Evaluation parameters

1) Visual Analog Scale (VAS): VAS is a scale developed by Price et al. which measures the severity of the patient’s pain [10].

2) Neck Disability Index (NDI): Disability was evaluated by NDI. There are a total of 10 items in this questionnaire including pain intensity, personal care, weight lifting, reading, headache, concentration, business life, driving, sleeping and recreation. Validity and reliability of the Turkish version of this questionnaire was established by Telci et al. [11]. Each of the items is given a score between 0 - 5 (0: bestcase, 5: worstcase). Mean values obtained by dividing the total score by the number of answered questions are assigned for the un-answered items and NDI score is found for the unanswered question. NDI total score is calculated from a total of 50 points [11].

3) Hospital Anxiety and Depression Scale (HADS): Assessment of psychological status was performed by using HADS. HADS is a self-assessment scale used for determining risk in terms of anxiety and depression and for measurement of the level and intensity

**Table 1:** Statistically comparison of groups in terms of pain, NDI, HADS and SF-36.

	Housewives (n:100)	Secretaries (n:100)	P Value
PAIN (VAS)			
Yes	63%	34%	<b>&lt;0.001</b>
No	37%	66%	
DURATION OF PAIN (month)	60±108*	24±42*	0.104
<b>NDI Total Score</b>	6.00±7.00	9.00±8.00	<b>&lt;0.001</b>
<b>HADS</b>	(Mean±SD)	(Mean±SD)	
Anxiety score	7.00±6.00	10.00±5.00	<b>&lt;0.001</b>
Depression score	5.00±5.00	8.00±6.00	<b>&lt;0.001</b>
<b>SF- 36</b>	(Mean±SD)	(Mean±SD)	
Physical Function	55.00±10.40	48.80±12.50	<b>0.002</b>
Physical Role Difficulty	49.20±14.10	49.20±17.65	0.188
Pain	51.60±14.10	46.50±18.20	0.093
General Health Perception	46.20±15.90	43.90±13.40	0.156
Vitality	53.80±14.20	46.70±11.80	<b>&lt;0.001</b>
Social Function	51.70±16.20	43.60±16.30	<b>&lt;0.001</b>
Emotional Role Difficulty	44.80±10.50	44.80±10.50	0.945
Mental Health	49.30±11.40	41.40±15.90	<b>&lt;0.001</b>
Physical Component Score	50.75±14.70	47.30±12.15	0.094
Mental Component Score	48.05±9.25	40.60±13.90	<b>&lt;0.001</b>

VAS: Visual Analog Scale; NDI: Neck Disability Index; HADS: Hospital Anxiety and Depression Scale; SF-36: Short Form-36

change in the patient. It includes a total of 14 questions and 7 of them measures anxiety and the other 7 questions measure depression [12]. Accordingly, those who had scores above these cut-off levels are considered at risk. It was found in the validity and reliability study conducted by Aydemir et al. [13] that threshold score is 10/21 for anxiety subscale and 7/21 for depression subscale.

4) Short Form-36 (SF-36): Quality of life assessment was performed by using Short Form-36 (SF-36). The SF-36 Quality of Life Scale is a short 36-item questionnaire. It assesses 8 areas including physical functioning, physical role difficulties, pain, general health perceptions, vitality, social functioning, emotional role difficulties and mental health. Health-related quality of life increases with higher scores at each of the subscales. It is quite sensitive in assessment of the positive and negative aspects of health status [14]. SF-36 is a self-assessment scale, and the validity and reliability of its Turkish version was shown by Kocyyigit et al. [15].

**Statistical analyses**

Analysis of the data was performed using IBM SPSS 22.0 (IBM Corporation, Armonk New York United States) statistical package program. Normal distribution of the data was tested using Shapiro-Wilk test and with variability co-efficients. Mann-Whitney U test was used in the comparison of two independent groups with Monte Carlo simulation technique. Spearman’s rho test was used in examining the correlation between variables. Pearson, Chi-Square and Fisher’s exact tests were used in the comparison of categoric data with Monte Carlo Simulation technique. Logistic regression test was used in determining the cause and effect relationship between

**Table 2:** Correlation coefficient between severity of neck pain and NDI, HADS, SF-36 scores and significance level.

Variables	Secretaries (n:100)	
	Pain (VAS) Correlation Coefficient	p value
NDI score	0.428	<0.001
HADS-A	0.042	0.738
HADS-D	0.089	0.472
SF-36		
Physical Function	-0.389	0.001
Physical Role Difficulty	-0.214	0.083
Pain	-0.544	<0.001
General Health Perception	-0.229	0.062
Energy / Vitality	-0.058	0.642
Social Functioning	-0.355	0.003
Emotional Role Difficulty	0.108	0.384
Mental Health	-0.014	0.911
Physical Component Score	-0.559	<0.001
Mental Component Score	0.061	0.623

VAS: Visual Analog Scale; NDI: Neck Disability Index; HADS: Hospital Anxiety and Depression Scale; SF-36: Short Form-36

categoric variable and explanatory variables in the dual (diotom) and multiple (multinomial) categories. Quantitative symmetrical data in the tables were expressed as mean ± standard deviation; asymmetrical data were expressed as median ± IQR (interquartile range) and median (maximum – minimum). Categoric data were expressed as n (numbers) and percents (%). The data was analyzed at a confidence level of 95%, and a p value < 0,05 was considered as significant.

**Findings**

The mean age of hospital secretaries was 30.5 ± 10 years, while the mean age of housewives was 35 ± 18 years. There was a significant statistical difference between the two groups in terms of pain status of participants (p <0.001). Significant statistical differences were not found between the two groups in terms of pain duration (p>0.05) (Table 1). When NDI scores of two groups were analysed, there was a significant statistical difference between the two groups with regards to total NDI score (p<0.001) (Table 1). When Hospital Anxiety and Depression Scale (HADS) scores of the participants were analysed, there was a significant statistical difference between the two groups with regards to both HADS-A scores and HADS-D scores (p<0.001) (Table 1). When SF-36 sub-scores were analysed, there was a significant statistical difference in the scores of physical functioning scores, vitality, social functioning, mental health and mental component (p<0.05) (Table 1). When the secretary group was examined in terms of relationship between NDI and VAS scores, there was a positive correlation and it was statistically significant (p<0.001) (Table 2). When the relationship between VAS scores and HADS scores was assessed in hospital secretaries, there were no significant correlations between VAS scores and HADS scores (p>0.05) (Table 2). There was a negative correlation between VAS and physical functioning, pain, emotional role difficulty and physical component score in secretaries and it was statistically significant (p<0.05). There were no significant correlations between physical role difficulties, general health perceptions, energy/vitality, emotional role difficulties, mental health

**Table 3:** Correlations and levels of significance between total duration of employment and duration of neck pain in existing jobs of secretaries, neck pain intensity, disability scores, anxiety and depression scales.

Variables	Secretaries (n:100)	
	Working time Correlation coefficient	p value
Duration of Pain	.422	<0.001
VAS	-.057	0.645
NDI	.202	0.044
HADS-A	-.003	0.975
HADS-D	-.073	0.473

and mental component score ( $p>0.05$ ) (Table 2). Positive correlations were detected between total duration of employment and duration of pain in terms of NDI scores in existing jobs of secretaries and it was statistically significant ( $p<0.001$ ) (Table 3). When the relationship between total duration of employment in existing job of secretaries and VAS, HADS scores were examined, there were no statistically significant relationships ( $p>0.05$ ) (Table 3).

## Discussion

The results of our study demonstrated that the prevalence of neck pain in hospital secretaries working in sitting position for a long time is higher than a control group of the same age and gender. In a study conducted in 2500 office workers in Sri Lanka by Ranasinghe et al. [16], 36% of the participants were found to have complaints of current neck pain. 15% of them described functional limitations due to neck pain, and 9% reported instances when they could not go to work due to neck pain. Woods [17] have investigated musculoskeletal system complaints of 129 office workers who were computer users in the UK and the prevalence were found as 86%. The most frequent complaint was recorded in the neck area with 58%. In our study, 66% of female hospital secretaries had neck pain, which is a higher rate in comparison with the medical literature. We believe that this may be due to absence of ergonomic training in Turkey. Currently, millions of employees have to use computers with the rapid development of the service sector, and they generally have to sit in improper postures for long periods. In a study conducted by Nejati et al. [6], 101 office workers who used computers were examined in terms of body posture, and 61% were found to work at an inappropriate posture. Medical literature between 1980 and 2007 were examined Griffiths et al. [18], and the length of time spent at the computer and less number of breaks were found to be risk factors for WMSD development. We believe that the prevalence of neck pain may have increased in Turkey, due to longer working hours and shorter breaks due to higher numbers of patients. It was stated in many studies that female patients carried a higher risk for WMSD in comparison to males in both the neck area and upper extremities. Ekman et al. [19] conducted a study examining the gender differences and proposed two explanations for this increased risk. Firstly, gender was a factor in non-work-related effects (psychosocial pressure, etc.); and the secondly, there might be a difference between men and women in terms of occupational exposure. Number of female secretaries was significantly higher than men in our hospital. Since we selected the housewives as the control group, we chose to take the female patient population. In the design of the study, since they belong to high risk group we planned to investigate only female secretaries and we did not include any male

secretary in the study. A study including also male secretaries may provide more information on this issue. We detected neck pain in 37% of housewives who were enrolled to our study as control group. While these rates appear to be somewhat high, they are consistent with the literature. 130 individuals with a complaint of chronic pain and 81 individuals without pain were investigated in a study by Yazici et al. [20]. The majority of patients with chronic neck pain were found to be housewives, and housewives were found to be a risk group in terms of neck pain. Researches asserted that housewives were exposed to extreme demands from family and immediate vicinity and they live a sedentary and monotonous life in Turkish society, thus they refer to a hospital with complaint of neck pain compared to other occupational groups. We found the prevalence of neck pain in housewives to be high, although not as high as hospital secretaries. We believe that high work loads of housewives at home may have caused this. One of the objectives of our study was evaluation of disability due to neck pain in hospital secretaries. In our study, disability was evaluated by Neck Disability Index (NDI). Pietrobon et al. [21] worked on 5 scales assessing the neck pain and function disorder, and they notified that validity of NDI in different study populations was only confirmed in these scales. In the literature, there are research examining the relation between neck pain and disability developed because of neck pain. In the study of Estlander et al. [22] 452 patients with neck, shoulder and back pain were followed by regular control visits for 2 years; as a result of the study, it was found that the disability level was the most important risk factor for determining chronicity and prognosis of pain. In our study, it was found that total NDI score determined in hospital secretaries was significantly higher than total NDI score determined in housewives. Neck pain was also more prevalent in hospital secretaries, thus we suggest that neck pain may have a tendency to be chronic and prognosis could be worse in hospital secretaries. In line with the literature, also in our study, a significant correlation was found in a between VAS scores and NDI scores in both secretary group and housewife group. Psychiatric symptoms are also detected in most individuals complaining from chronic pain. These symptoms mostly develop because of experienced pain during the course of time [20]. Depression, anxiety and sleep disturbances may be experienced concomitant with chronic pain. Above mentioned psychiatric problems may reduce pain threshold and increase the severity of pain symptoms. In a meta-analysis by Linton et al. 913 studies in literature related to psychological factors in neck pain were screened [9]. As a result, it has been found that many psychological factors such as anxiety, depression, affective disorder, stress and cognitive functions affected the neck pain. They also found that psychological factors were also directly related to the duration of pain and onset of pain.

Psychosocial factors also play an active role for development and treatment of UE-WMSD. Significance of these factors are emphasized in National Institute for Occupational Safety and health report. Increasing job stress, workload change, occupational monotony that limits decision-making initiative, uncertainty about the person's professional future, lack of co-worker support and the absence of manager support are the factors stated in this report [23]. It was found in our study that the mean anxiety and depression scores of hospital secretaries were significantly higher than the mean scores of housewives. While high rates of depression and anxiety in hospital

secretaries may have increased the prevalence of neck pain, chronic neck pain due to ergonomic causes may have increased the levels of anxiety and depression. In our study, we found that neck pain in hospital secretaries affected quality of life. In some research, a strong correlation between severity of neck pain induced by WMSDs and physical and mental functions was found. It was reported that this relation was more pronounced especially with physical function [24]. In our study, significant negative correlations were found between severity of neck pain in secretaries and physical function and physical component score of SF-36 sub-scores. However, no relation was observed between severity of pain and mental health and mental component scores. In the study of Cote et al. [25], a negative relation was found between SF-36 general health perception sub-score and severity of neck pain. There was no significant relation between general health perception and severity of neck pain in our study. A significant negative correlation was found in our study between severity of neck pain and physical function and social functioning of SF-36 sub-scores. In our study, similar to the results of literature, we determined that the high-risk group for presence of neck pain was hospital secretaries who worked on computer for a long time. In a 3-year observational study conducted by Ariens et al. [26] on 1334 office workers, there was a strong relation between neck pain and sitting time. If a person worked in the same position for 95% of working hours, it was stated that the risk of exposure to neck pain further increased. In a study conducted by Demure et al. [27] with 273 office employees working at The World Bank, it was detected using the computer more than 7 hours a day and having few breaks were risk factors for neck pain. In study conducted by Andersen et al. [28] which was performed with 2146 technical assistants working on computer, they stated that risk of acute neck pain was increased prominently in computer users but there was no relation between chronic neck pain and intensity of use of computer. This study was conducted by objective monitorization of working hours [28]. In our study, the entire 100 female hospital secretaries who were enrolled for the study worked on computer for 6 hours per day and 30 hours in a week. But these times were self-declared by the subjects. As Anderson et al. [28], one of the limitations of our study is that we have not performed objective monitorization.

## Limitations

The small number of subjects included in the study, lack of a control group of female hospital secretaries working in different work intensity and lack of monitorization of employees to confirm the self-declared information can be stated as the limitations of our study. We think that multicentre studies with large participants including more objective follow-up mechanisms are needed.

## Conclusion

As a conclusion, female hospital secretaries are at risk in terms of neck pain with disability and psychological symptoms and we also found that quality of their lives were impaired. We believe that this should be prevented and corrected to maintain employees' happiness and labour productivity. We consider that ergonomic trainings and initiatives in the light of current literature are important for prevention and treatment. In addition, we are of the opinion that assessment of these employees psychosocially will be also provided beneficial.

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