

Estimation of the psychological load in the performance of nurses' work based on subjective fatigue symptoms

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Abstract

Purpose: The performance of ergonomic analyses for workplaces is justified by the fact that safe and comfortable working conditions for employees are required. The obtained results may be used to facilitate the implementation of organizational changes in health care centres. A complex assessment of occupational load is not always possible. In this paper it is limited to one factor, constituting the psychological component. The aim of this paper is to assess the psychological fatigue of nursing personnel.

Material and methods: The only indicator analysed in the study concerns the activity of nurses working on two or three shift schedules on two clinical wards. To measure psychological fatigue one of the available scales was used, i.e. the Japanese questionnaire. In total 108 subjective survey records of fatigue were obtained.

Results: The obtained results show that overall activity decrease was between small and average. On the 12-hour shift schedule this decrease amounted to 29.34% (cardiology) and 34.77% (surgical), whereas on the 8-hour shift schedule it was 24.58% and 17.36%.

Conclusions: With a more significant activity decrease recorded for the 12-hour shift schedule, it should be assumed that the quality and efficiency of work performance on 8-hour shifts is higher and the risk of error decreased.

Key words: psychological load, nurse, physical fatigue.

Introduction

Psychological load, as well as fatigue resulting from physical discomfort, is a factor of work performance. In the case of nurses, it results primarily from the specificity of working among sick and suffering people [1].

If we assume that psychological load refers to the subjective responses of employees to the requirements of their job, the level of this load depends on the difficulty of a task, the impact of both the internal and the external working environment, and individual capabilities [2].

Both in the past and at the present time the possibilities of improving work performance and the reduction of its biological cost remain the focus of researchers' attention.

The relationship between the employees and the elements of their work environment are the scope of the field of ergonomics. Ergonomics is aimed at the reduction of workload consequences and concurrent risks with the maximum possible application of technological achievements [3]. The term *ergonomics* was used for the first time by the Polish naturalist, Jastrzębowski (1857) to describe the science concerning the powers and skills given to a human being by the Creator [4]. The term *ergonomics* was created by the combination of two words of Greek origin: *ergon* meaning work, and *nomos* meaning a rule or law. Krauze has defined ergonomics from the medical point of view by reformulating its name as industrial ecology. In such a meaning ergonomics is no longer limited to describing and analysing the work environment, but also endeavours to adapt the environment to the anatomical and physiological requirements of the body of a working individual by the utilization of all available measures.

Ergonomic methods and techniques are willingly applied in the rationalization of work processes. Currently the analysis of the work process performed by workers fails to succeed without the prior conducting of ergonomic surveys.

Nursing work has been considered as the most difficult and most responsible. It entails the saving of human health and life,

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and demands ongoing availability and coping with the requirements of a work position. Inevitably, a psychological load, both mental and emotional, occurs [5]. The purpose of this paper is an attempt to estimate the psychological load in nursing work positions based on subjective fatigue symptoms. Activity, as one of three criteria, was analysed.

The major question concerning the research has been formulated as follows:

What is the workload in the nursing position based on subjective fatigue symptoms?

The major question has been supplemented by detailed questions:

1. To what degree does the activity of nurses working in the 12- and 8-hour shift systems decrease in particular time intervals?
2. Does work in two different wards (cardiology and surgical) have an influence on the degree of decrease in the activity of nurses?
3. What is the total activity decrease concerning particular work shifts?

Material and methods

The survey was based on the standardized method of a Japanese questionnaire [6]. The questionnaire enables the analysis of the psychological load based on subjective fatigue symptoms within the scope of three reported types of symptoms: 'A' – activity, 'B' – motivation, 'C' – projection of physical fatigue. Such a type of measurement concerning general and sensitive factors provides essential information regarding the type of psychological load [7]. The questionnaire was prepared by Yoshitake in 1967 for the survey needs of the Industrial Fatigue Research Committee of the Japanese Association of Industrial Health [6]. The Japanese questionnaire, when applied in the authors' own research for the estimation of psychological load in nurses, was modified with respect to the original. The modification concerned the number of questions and their contents [2]. The questionnaire includes 30 expressions identifying the current subjective feeling of a surveyed individual. A surveyed nurse, when estimating subjective symptoms of fatigue, identifies current feeling on a scale from 5 to 1 of the research instrument. The factor of the total fatigue is calculated based on the frequency index concerning the incidence of fatigue in per cent according to the equation:

$$\text{\% frequency index of fatigue} = \frac{\text{number of entries}}{\text{max. number of entries}} \times 100\%$$

where: number of entries is the score for particular symptoms A, B, or C; max. number of entries equals 4x10x number of surveyed individuals

The survey was carried out in January, 2007 in two clinical wards, i.e. cardiology and surgical. It included nurses working in the 12-hour (daytime shift) and 8-hour (morning shift) systems. 108 subjective reports on fatigue symptoms were obtained

Table 1. Estimation of workload based on subjective fatigue symptoms in per cent in A group – activity decrease. 12-hour shift schedule

Work in 12-hour schedule		
Time of survey	Cardiology	Surgical
Beginning of shift 7.00 a.m.	11.07%	15.22%
In the middle of shift 1.00 p.m.	18.92%	31.13%
End of shift 7.00 p.m.	58.03%	57.95%
Total activity decrease	29.34%	34.77%

as a result. The survey was conducted with the involvement of female students of post-graduate extramural studies from the Faculty of Nursing of the MU of Białystok. Nurses working in the two-shift system evaluated their fatigue: at the beginning of a shift, in the middle of the shift and at the end of the shift, whereas the nurses working in the three-shift system evaluated fatigue at the beginning of a shift and at the end. The age of surveyed individuals in both groups was similar. The most numerous group included nurses aged 31 to 40 (40% in the surgical ward and 45% in the cardiology ward). Regarding the employment period, the most numerous group of nurses consisted of those with 16 to 25 years' employment in both wards. Their share in the cardiology ward amounted to 50%, and in the surgical ward 40%.

Results

The first group of fatigue symptoms, concerning activity, i.e. 'A' was analysed. Questions contained in the A section of the questionnaire referred to the following symptoms: I want to lie down, I feel drowsy, I feel dizzy, my eyes are tired, my whole body feels heavy, I get tired in the legs, I get clumsy in motion, my whole body feels tired, my head is heavy, I yawn. The calculation of activity decrease in nurses was calculated according to the applied equation for identification of the index of total fatigue, with time intervals during the shifts taken into account. The interpretation of the fatigue index calculated in per cent for the A group concerning the activity of nurses working in the 12-hour schedule (*Tab. 1*) has revealed an index of activity decrease (A) at the beginning of a shift amounting to 11.07% on the cardiology ward, and 15.22% on the surgical ward. The most significant activity decrease at the beginning of work was reported for the 8-hour schedule (23.75%) on the cardiology ward. This indicates decreased activity already at the beginning of work. An activity decrease by 5.2 times was recorded after the 12-hour shift in the cardiology ward, and slightly lower, however, also considerable, in the surgical ward. The indexes calculated in per cent for activity decrease attained 58.03% (cardiology ward) and 57.95% (surgical ward). The analysis of data concerning activity decrease collected at 7.00 a.m., 1.00 p.m. and 7.00 p.m. revealed the most significant activity decrease occurring between 1.00 p.m. and 7.00 p.m. During the 8-hour shift the most significant activity decrease occurred after work (27.78%) with respect to the beginning of the shift (6.94%) and it was recorded in the surgical ward (*Tab. 2*).

Table 2. Estimation of workload based on subjective fatigue symptoms in per cent in A group – activity decrease. 8-hour shift schedule

Work in 8-hour Schedule		
Time of survey	Cardiology	Surgical
Beginning of shift 7.00 a.m.	23.75%	6.94%
End of shift 2.35 p.m.	25.41%	27.78%
Total activity decrease	24.58%	17.36%

A more significant total activity decrease was found in nurses working in the 12-hour schedule. The calculated index was double for the surgical ward (Fig. 1).

Discussion

The present paper has focused on the analysis of only one group of fatigue symptoms, i.e. group ‘A’, concerning activity. Therefore, the identification of the total psychological load requires the analysis of another two groups of symptoms, i.e. ‘B’ concerning motivation, and ‘C’, concerning the projection of physical fatigue. The 12-hour shift schedule is preferred by the predominating part of the nursing personnel. Employers are also concerned with benefits resulting from such a shift schedule, owing to the possibility of a reduced demand for staff [1,8]. The preferences regarding the duration and time of shifts are mainly connected with non-occupational issues. Yet the fact remains that the work in the two shift schedules results in a more significant load, both physical and psychological, in the position of a nurse. The psychological weariness and increased tiredness result in a deterioration of performed work and an increased number of error incidents [8].

The carried out surveys presented the activity decrease, and the concurrent increase in fatigue, to be more significant in nurses working on 12-hour shifts. This finds confirmation in the results of surveys carried out by Gawel, identifying the average response time concerning mental and physical diligence in nurses working according to both schedules. The longest average response time was recorded in the group of nurses employed on a 12-hour shift, and particularly concerned the night shift.

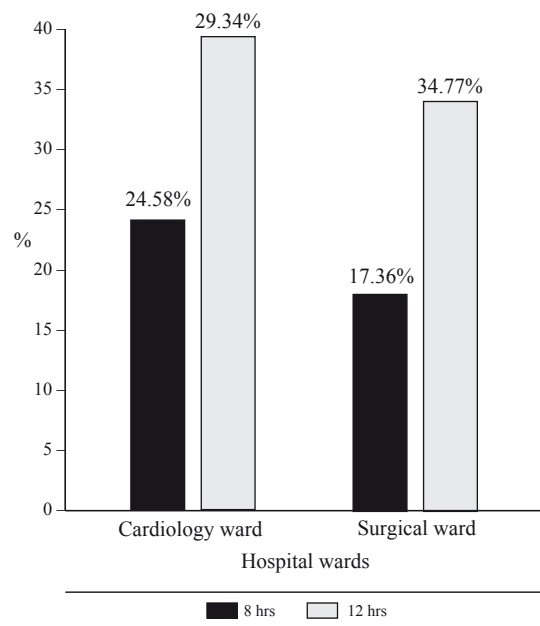
The research in the work process carried out in medical care centres implies that nurses are exposed to excessive physical and psychological load, and this is essentially influenced by work organization, technical equipment and the conditions created by premises [6].

A combined application of both the Japanese questionnaire and an assessment method ignoring subjective determinants would enable a more meticulous analysis of psychological load concerning workplaces [2,10].

Conclusions

The total index for activity decrease in nurses employed in the 12-hour shift schedule amounted to 29.34% (cardiology ward) and 34.77% (surgical ward). Regarding the 8-hour sched-

Figure 1. Total activity decrease in two shift schedules



ule the results obtained were 24.58% and 17.36%, respectively. Total activity decrease was determined on the border of low and average. Activity decrease in cardiology and surgical wards was similar. The degree of activity decrease was irrespective of the type of wards.

With a more significant activity decrease recorded for the 12-hour shift schedule, it should be assumed that the quality and efficiency of work performance on 8-hour shifts is higher and the risk of error decreased.

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