



Original Article

Influence of Shiftwork on Greek Nursing Personnel



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ABSTRACT

Background: The aim of this study was to investigate the burden experienced by nursing personnel working irregular shifts in Greece and to conduct the first test of a Greek version of the Standard Shiftwork Index (SSI).

Methods: A cross-sectional survey was carried out. The SSI was completed by 365 nurses and nursing assistants working shifts, including nights.

Results: Female nursing personnel and those suffering from a chronic disease were most affected by working rotating shifts as they had elevated scores on the majority of the SSI scales, such as sleep, chronic fatigue, digestive and cardiovascular problems, general health questionnaire, cognitive and somatic anxiety, shift time satisfaction, engagement and disengagement strategies, languidity, flexibility, and neuroticism. Nurses with longer working experience and those with family responsibilities also scored higher on some of the SSI scales, such as the sleep, shift time satisfaction, social and domestic disruption, disengagement strategies, morningness, and languidity scales.

Conclusion: Shiftwork affects female nurses, those with chronic disease, older age, and domestic responsibilities more severely. Therefore management should take these factors into account when designing work schedules to alleviate the burden caused by shiftwork.

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1. Introduction

Shiftwork is an increasingly common characteristic of modern society. At present, nearly one-fifth of the total global workforce works in shifts, with around 19% of the European Union workforce engaged in night shiftwork [1]. This raw percentage disguises a more complex work pattern. In fact, in European countries, a minority of the employed workforce is engaged in regular day work: 22% of men and 11% of women. Established office hours are thus becoming more of a rarity than a norm [2]. Rotation and scheduling are the main characteristics of shiftwork. Healthcare personnel, and nurses in particular, are largely, and traditionally, locked into schedules that provide 24-hour care and include night shiftwork and are therefore a focus for special attention in published work on shiftwork.

In general, staff who work shifts tend to experience problems in four main areas caused by the desynchronization of the endogenous physiological system of circadian rhythms [3,4]. The first relates to increased fatigue and sleepiness caused by a decreased amount of sleep, which results in a cumulative sleep debt when trying to sleep during the day. The second relates to their health: staff who work shifts tend to suffer from poorer general health, both physiological and psychological, including an increase in gastrointestinal and cardiovascular problems. The third area of concern relates to their family and social life. Staff who work shifts tend to suffer from poorer family and social relationships because their working hours often overlap with times normally devoted to societal and family obligations. The fourth cluster of problems relates to the quality of the work itself and the satisfaction derived from it [1].

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2. Materials and methods

2.1. Aims

The aim of this study was to investigate the burden experienced by nursing staff working on an irregular shift system in Greece and the possible factors, such as demographic factors and work-related characteristics associated with this pattern of working. In particular, we aimed to test for the first time with a Greek population one of the most widely used instruments deployed in shiftwork research, i.e., the Standard Shiftwork Index (SSI).

2.2. Study design

A cross-sectional study was carried out to study the problems caused by shiftwork in nursing staff working irregular shifts and to perform an initial test of a Greek version of the SSI. The study was conducted in three public general hospitals in Athens, Greece. Most of the nursing staff at these facilities work irregular rotating shifts (morning, evening, and night shifts), but there is also a subset working exclusively morning shifts. For the cohort investigated here, morning shifts are scheduled from 7 AM to 3 PM, evening shifts from 3 PM to 11 PM, and night shifts from 11 PM to 7 AM. For the permanent morning shift group, morning shifts are scheduled from 7 AM to 3 PM.

2.3. Participants

The study population included all registered nurses (university and technical institute graduates) and nursing assistants working morning or night shifts for at least 3 months prior to the date of the survey and was further limited to those who had been working for at least 2 years. A total of 750 anonymous printed surveys were delivered to nurses and nursing assistants working an irregular shift system, including night shifts, and those permanently working morning shifts. A total of 365 completed questionnaires was returned, representing a response rate of 49%.

2.4. Instrument

The instrument used for data collection was the SSI questionnaire [5]. The SSI questionnaire is a well-established multi-scale instrument theoretically linked to published work on the known impacts of shiftwork, as well as those variables which are thought to modify an individual's response to shiftwork such as individual circumstances (age, marital status, children to look after), personality characteristics (morningness/eveningness, extraversion/neuroticism, rigidity, and vigor), coping strategies, and personal outcomes for the individual (including physical and psychological health, sleep disturbance, and social and domestic disruption). With the permission of the SSI authors, the instrument was initially translated into Greek and then a back translation was performed by two independent translators to ensure equivalency. The process of translation and cultural adaptation followed international recommendations [6]. The final translation was reviewed by the study authors. The questionnaire had acceptable to high internal consistency with Cronbach α coefficients ranging from 0.70 (extraversion scale) to 0.90 (chronic fatigue scale). The scales included in SSI are as follows:

1. sleep questionnaire;
2. general job satisfaction;
3. chronic fatigue;
4. physical health questionnaire – this contains two subscales, measuring cardiovascular and gastrointestinal disorders;

5. general health questionnaire;
6. cognitive somatic anxiety questionnaire;
7. social and domestic survey – this contains two subscales, the first measures the degree to which individuals are satisfied with the amount of time their system leaves them for specific activities (shift time satisfaction) and the second scale consists of three questions relating to the amount of social, domestic, and non-domestic disruption (social domestic disruption) experienced as a result of working shifts (social and domestic life);
8. coping questionnaire containing two subscales – engagement and disengagement;
9. composite morningness questionnaire;
10. circadian type inventory, containing two subscales of languidity and flexibility;
11. Eysenck personality inventory, measuring two major dimensions of personality – extraversion and neuroticism.

A full description of the questionnaire has been presented elsewhere [5,7]. Demographic characteristics were also recorded, including personal and work characteristics.

2.5. Ethical considerations

The study protocol was approved by the scientific board and the ethics committee of each hospital. To protect the privacy of the respondents, the completed questionnaires were collected in sealed envelopes and contained no individual identifiers. Informed consent was obtained from all participants.

2.6. Statistical analysis

Quantitative variables are presented with mean, standard deviation, and/or minimum and maximum values, while the categorical variables are presented with absolute and relative frequencies. To identify the demographic and individual variables associated with the SSI dimensions, a series of multiple linear regression analyses was conducted. The independent variables explored were: sex, age, family status, professional training, the number of family members that needed to be looked after, chronic disease, type of shift worked, the presence of a second paid job, and work history. Regression coefficients (β) with their standard errors were computed from the results of the regression analyses. All reported p values are two-tailed. Statistical significance was set at $p < 0.05$ and analyses were conducted using SPSS statistical software (version 17.0).

3. Results

3.1. Demographics

Table 1 presents the sample characteristics. The total sample consisted of 49 men (13.5%) and 313 women (86.5%). The majority of nurses (75.9%) had a degree from a technical institute, although 26 nurses (7.6%) had a bachelor degree from a university. A minority (39.3%) of the sample was working exclusively morning shifts, with the balance (60.7%) working rotating shifts. Almost half of the sample (46.6%) reported that they suffered from a chronic disease.

3.2. Standard Shiftwork Index scales

Table 2 gives the mean values for the SSI scales and Table 3 gives the correlation coefficients between the SSI scales. There was significant inter-correlation between most of the scales. The engagement scale was significantly correlated only with the scales

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