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BEHAVIOURS, ATTITUDES, AND DIETARY INTAKE IN NURSING STAFF MEMBERS WHO WORK SHIFTS

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Abstract

Introduction: Nursing healthcare staff members are exposed to many stressors. Of said sources of stress, night shifts influence weight, food intake and eating behaviours, in addition to causing eating disorders. Objective: To discover the irregular behaviours and attitudes towards food, weight, and body image of healthcare personnel, touching on healthcare workers who have got night shifts and those who haven't got night shifts. Population: 94 nursing healthcare professionals from the Miguel Servet Hospital of Zaragoza. Instruments: Structured interview, test of attitudes towards eating habits and eating disorder inventory. Results: The nursing healthcare staff working shifts showed greater motivation to lose weight, lower carbohydrate consumption and more dysfunctional dietary behaviours (skipping meals and snacking) than the nursing healthcare staff not working shifts. Conclusions: Further work on prevention within the hospital network is needed to promote a rich and varied diet and healthier eating habits and to prevent the onset of eating disorders in the nursing healthcare staff.

Keywords: Eating habits, eating disorders, intake, shift workers, nursing healthcare staff.

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1. Introduction

Please replace this text with context of your paper. Most of the studies published to date about shiftwork speak of the negative consequences thereof on workers. There is also research that notes that the most serious consequences are those caused by shifts that include the night, as these shifts are the most devastating both physically and psychologically. Likewise, other studies focus on variables that affect these devastating effects, such as age, the time the individual has worked shifts, having a partner or not, working during daytime hours, etc.; however, despite there being numerous studies published about the healthcare population, there are very few that analyse the behaviours towards food and eating disorders of said workers. Moreover, this is a model population that should transmit and undertake healthy eating habits so as to set an example for the rest of the population. There are healthcare professionals who, despite wanting to eat well, are unable to do so because of the environment in which they work, the availability of unhealthy foods, the time slots in which they have to eat, work-related stress, and the hospital service in which they work – all factors which make it difficult for them to eat well, even if they want to. Therefore, the study presented herein is essential so as to not only discover and analyse what is going on in terms of the eating habits and food (form and mode) of healthcare personnel working shifts but also, once the aforementioned is known, this study is likewise essential so as to promote, in work centres, preventive programmes to help avoid problems. This is important because not being able to eat well can lead to eating disorders, increases in body mass index, and/or inadequate eating habits.

Fernández-Montalvo and Piñol (2000) studied the consequences of shifts from two different perspectives: the psychological and biological perspectives. From a biological perspective, human beings have learned to remain in a state of wakefulness during the day and to sleep at night; thus, working a shift that forces one to be awake all night (or part of the night) disrupts the workers' biological clock (Monk & Folkard, 1992; as cited by Fernández-Montalvo, & Piñol, 2000, p.219). From a psychological perspective, shiftwork causes: sleep disturbances, work-related stress, symptoms of depression, and psychosocial problems (Fernández-Montalvo & Piñol, 2000). The shift is another of the stressful demands of the workplace. The constant process of adaptation to shifts is a cause of work-related stress (Peiró, 1993). The pathologies detected in people who work shifts are more marked in the female sex due to the social and family burdens borne by women; it seems that carelessness in terms of eating alters women's diets (Cuartero, Valiño, Carvajal, & Amorós, 2005).

Shiftwork leads to adverse consequences on workers' health, but there are different factors that influence a workers' tolerance for shiftwork and dampen its effects. These factors relate to individual, family, social and work characteristics (Costa, 1996).

The *American Nurses Association* warns that most nursing staff members do not meet the dietary recommendations for the promotion of health and the prevention of chronic diseases. Despite having extensive knowledge about a healthy diet, healthcare staff members acknowledge that when they work shifts, their food-related attitudes and intake are not adequate (Nejman & Gotlib, 2017).

It seems that shiftwork is associated with having a greater chance of being overweight and suffering from obesity (Smith, Fritschi, Reid, & Mustard, 2013); but, in past studies, only those who worked at night had high rates of obesity. Thus, it has been concluded that working shifts, especially at

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night, causes workers to eat improperly (Zhao, 2012). Work at night –in addition to changing sleep patterns and other daily habits, such as physical exercise and food intake– increases the possibility of weight gain (Geliebter, Gluck, Tanowitz, Aronoff, & Zammit, 2000; Reeves, Newling, and Guissane, 2004; Ruíz de la Fuente et al., 2010). Lastly, there is research that concludes that the problems of being overweight and obesity amongst nursing personnel are not only associated with shiftwork, age, gender, full-time work (Bogossian et al., 2012) and the years one has been working shifts (Griep et al., 2014; Min-Ju et al., 2013; Yoshizaki et al., 2010) but also with workers' BMI.

Additionally, shiftwork can also cause different eating disorders. More specifically, work at night is associated with a higher frequency of digestive disorders and/or appetite disorders (Bonet et al., 2009). Likewise, working rotating shifts and night shifts have been associated with bulimia nervosa (Sindicato de Enfermería de España, 2015), as well as with restricted and emotional eating habits (Almajwal, 2016). Nurses who worked shifts skipped more meals and they also recognised that when working at night, they all suffered from symptoms such as: loss or excess of appetite and a greater intake of sweets and lower intake of milk, along with other dietary restrictions (Nejman & Gotlib, 2017). Lastly, Ferrada, Salomón, Pina, Lavandaio, and Carena (2008) detected altered eating habits, especially in resident doctors subject to being on call at night.

2. Problem Statement

Currently, companies in sectors that are highly demanded by society have to work twenty-four hours a day to respond to the different needs of the population. Professions like firefighters, police officers, nurses, etc. are all part of a collective whose schedules are distributed over shifts.

The interest from which our research arises –a general interest in knowing the consequences that working shifts causes on diet– stems from different concerns that came up after analysis of the various publications about shift work. Firstly, there are very few studies in Spain that talk about poor eating habits, inadequate dietary intake and an unhealthy lifestyle caused by shiftwork. Secondly, the research carried out to date explores and establishes relationships between some of the aspects that are studied herein, but not between all those aspects considered to be of interest in order to design better psychosocial prevention plans in companies. Finally, thirdly, eating disorders such as anorexia or bulimia and other eating problems have been studied very little in terms of their causal relationship with shiftwork.

Having healthcare personnel as the target group under investigation in this study has not only come about because many of these individuals work shifts but also because this is a collective that promotes health and is a model for all citizens, in addition to having to maintain direct and regular contact with the entire population and a neutral point of view. This group also knows the negative consequences of shiftwork as it pertains to eating habits, food intake and body mass index (BMI) because many times they experience said negative consequences at first hand. Having said that, sometimes they do not experience said negative consequences themselves; however, they know what is healthy and what is not in terms of the promotion, prevention and maintenance of a healthy BMI. Therefore, it seemed interesting for us to find out about healthcare professionals' food-related intake, behaviours and attitudes and to draw comparisons within the sector between those who work shifts and those who do not.

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3. Research Questions

Nursing healthcare professionals who work shifts, especially those who work nights, have a higher BMI, present less structured dietary behaviours and more eating disorders, and have a food intake of poorer quality than healthcare workers who do not work shifts.

4. Purpose of the Study

Main Purpose

• To study if, in the population under study, working shifts brings about irregular eating habits, improper dietary intake, a higher BMI, and/or eating disorders.

5. Research Methods

5.1. Research design

The design that we have considered for our research is a correlational design investigating group differences; or, put more technically, this would be an ex-post facto correlational design comparing groups (Montero & León, 2005).

5.2. Definition of variables

Independent Variable: shiftwork, which was assigned two values – workers who work shifts and whose shifts are at night (CTN), and workers who do not work shifts (STN) – even though they rotated working hours, they did not work at night.

Dependent Variables

• BMI: body mass index.

• Irregular behaviours and attitudes towards food, weight and body image – analysed through questionnaires: EAT-40 and EDI.

• Food intake and eating behaviours.

5.3. Population and sample

The population for this study lived in the city of Zaragoza. The work sector of the research subjects was the Public Health Sector. The range of health professionals that were used for this study included male and female nurses who undertook their work at a hospital belonging to the Government of Aragon. A non-probability convenience sampling method was used.

The inclusion criteria were as follows: being occupied at the time when the questionnaires used for the study were passed out, working at the Miguel Servet Hospital, undertaking the job of nurse and adequately completing all the questionnaires passed out.

In accordance with the definition of shift work, we grouped healthcare personnel into two categories: CTN and STN. The STN healthcare personnel group was made up of 29 people and the CTN healthcare personnel group had 65 people.

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5.4. Instruments

The instruments used in this research study were as follows:

- Sociodemographic questionnaire on eating habits and lifestyle.
- Eating Attitudes Test (EAT) by Castro, Toro, Salamero and Guimerá, 1991.
- Eating Disorder Inventory (EDI) by Guimerá and Torrubia, 1987.

5.5. Design and data analysis

For the analysis of the assessment instruments, the SPSS 20 software package for Windows was used (Norusis, 2011). In all statistical tests, $p<.05$ was set as two-tailed significance level. For many of the statistical analyses, the sample was divided into two groups: CTN (workers who worked shifts) and STN (workers who did not work shifts). To see if there were significant differences (in accordance with the shift and the presence or not of excess weight), for sociodemographic variables, clinical scales, dietary behaviours and dietary intake, we used the Student's t-test with an effect size (g) for continuous variables, and the $\chi 2$ test for categorical variables. In both, the odds ratios (OR) were obtained, as well as their corresponding p-values.

6. Findings

6.1. Characterization of the Sample

The sample's characterization is detailed in the table 01 below.

Table 01. Characterization of the sample

Variables	STN (n=29)	CTN (n=65)
BMI (Kg/m2) *	23.23 (3.18)	24.13 (3.83)
Normal Weight Women	21.80 (1.84)	21.70 (1.61)
Normal Weight Men	-	22.66 (1.52)

Note: STN: no night shift; CTN: with night shift.
*Cells represent averages and standard deviations.

6.2. Results

No significant differences were observed between the group of nurses working shifts and the group of nurses not working shifts in terms of body mass index. Still, we thought it would be interesting to analyse the "time working shifts" variable, as this variable had to do with the number of months that the healthcare professional was working shifts in his/her profession. In table 02, the results obtained with the Student's t-test are shown, as applied to the dependent variable: normal weight/overweight, in accordance with the body mass index each worker had at the time the study was undertaken and the time they had been working on shifts; it was found that women who were overweight had been working shifts more time ($t=-4.03$; $p=.000$).

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Table 02. Time working shifts by group: normal weight and overweight

Time working shifts (in months) *	NORMAL WEIGHT (n=64)	OVERWEIGHT (n=20)	t	p	g
Women	95.38 (116.33)	**237.79 (157.01)*** **	-4.03	.000	-1.12
Men	122.0 (154.41)	38.33 (26.33)	.93	NS	

Note: *Cells represent averages and standard deviations. CI: 95% confidence interval: ***p<.001, NS: correlation not significant

In order to discover the existence of eating disorders within the study's population, we analysed the average scores of the groups of nursing healthcare professionals that worked shifts and those who didn't work shifts. To do that, a comparison of averages was undertaken through the Student's t-test in relationship with the clinical scales. In Table 03, it can be seen that the group of individuals working shifts gave a significantly higher score to the variable of "motivation to lose weight" than the group of individuals not working shifts (t=-2.18; p=.03); in contract, for the variables "bulimia" and "ineffective eating patterns", the STN group got scores significantly higher than the CTN group (t=2.60; p=.00), (t=2.08; p=.01), respectively.

Table 03. T-test clinical scales for STN and CTN groups

Clinical Scales	STN (n=29)	CTN (n=65)	t	*p*	*g*
Motivation to lose weight	1.36 (2.46)	**2.78 (3.69)***	-2.18	0.03	-.42
Bulimia	**1.71 (2.73)*****	.51 (1.67)	2.60	0.00	.58
Ineffective Eating Pattern	**2.61 (3.45)*****	1.37 (2.19)	2.08	0.01	.47

Note: *Cells represent averages and standard deviations. CI: 95% confidence interval: ***p<.001, **p<.01, *p<.05; g: effect size.

In Table 04, the sample's eating behaviours in which significant differences were obtained are described, as well as the OR. Regarding the OR calculated, it was found that skipping meals acted as a risk factor in the group of those working shifts; the probability of having this behaviour was 4.74% higher if work was undertaken at night. Snacking was also more common in the group of nurses working shifts; the risk of said behaviour was five times greater if work was undertaken at night.

Table 04. Workers' eating behaviours by shift

	STN (n=29)	CTN (n=65)	OR (95% CI)	*p*
Skipping Meals	3 (11.5%)	**23 (35.4%)****	4.74 (1.29-17.39)	.01
Snacking	22 (26.5%)	**61 (73.5%)****	4.85 (1.29-18.19)	.01
	STN (n=29)	**CTN** (n=65)	**OR** (95% CI)	*p*

Note: Cells represent absolute frequencies and percentages with respect to the same group; OR: odds ratio; 95% CI: 95% confidence interval: **p<.01.

Lastly, Table 05 describes the contents of the food in relationship with the intake of carbohydrates, with the result that workers who did not work shifts (STN) ate more potatoes (t=5.36, p<.001), pasta (t=3.64, p=.001) and rice (t=3.21, p=.002) than the group that worked shifts.

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Table 05. T-test Variables Related with the Intake of Carbohydrates by Shift

	STN (n=29)	CTN (n=65)	t	p	g
Daily servings of bread	2.20 (1.03)	2.04 (1.02)	1.06	NS	
Weekly intake of potatoes	**2.18 (1.44)*** **	1.21 (1.04)	5.36	.000	.80
Weekly intake of pasta	**1.23 (0.73)** **	0.85 (0.67)	3.64	.001	.55
Weekly intake of rice	**1.12 (0.99)** **	0.77 (0.54)	3.21	.002	.47

Note: STN: no night shift; CTN: with night shift. Cells represent averages and standard deviations for each group; 95% CI: 95% confidence interval: ***p<.001, **p<.01; NS: value not significant.

7. Conclusion

The research analysed about medical staff working shifts does confirm the existence of a higher BMI both for workers who work on rotating day shifts and for those who work at night when compared with those who work during the day on fixed shifts (Smith et al., 2013; Zhao, 2012). Likewise, said research finds a prevalence of being overweight and suffering from obesity (Ruíz de la Fuente, et al., 2010) or a greater chance of gaining weight if night shifts are worked (Geliebter et al., 2000). In contrast, in our research there were no differences in terms of BMI between the groups of healthcare workers who worked shifts and those who did not.

There are other variables such as gender and the time an individual has done shift work that influence the BMI of healthcare workers. In terms of gender, the study by Escasany, Tumminello, and González (2008) confirmed that 35% of women working at night were overweight and 41% were obese. Other studies have indicated that men working shifts are the ones who normally have a higher BMI (Griep et al., 2014). In terms of the amount of time working shifts, the study by Parkes (2002) and Tanaka et al. (2010) showed that women who had been working more time on shifts were those whose BMI was highest. In line with that study, our results obtained did show that overweight nursing staff members who have spent more time working shifts had a higher BMI than those who were not working shifts.

For further research, and in relation with the BMI, it would be desirable to obtain a more comparable sample in terms of sex and/or to consider other variables that may also affect workers' BMI, such as: seniority at work (Ruíz de la Fuente, et al., 2010; Sánchez-Lopez, Saavedra-San Roman, Dresch, Garcia-Quintans, & Rodrigo-Holgado 2016) and the age of subjects (Antunes, Levandovski, Dantas, Caumo, & Hidalgo, 2010; Escasany et al., 2008; Chee et al., 2004; Di Lorenzo et al., 2003). What is certain is that the results obtained show that women who have spent more time working shifts are more overweight – but there may be other variables in addition to time worked that explain their excess weight; therefore, it would be advisable to conduct a longitudinal study that would record the BMI of the nursing healthcare staff over their working life, as well as to isolate the BMI from other variables that can be influential thereto.

Following the hypothesis put forward, which also considered shiftwork to cause eating disorders, the *Sindicato de Enfermería de España* ("*Spanish Union of Nurses*", 2015) confirmed that 16% of the sample analysed suffered from bulimia nervosa, assuming the cause thereof to be shift work. In our research, it turned out that the group of nurses not working shifts was the one that showed eating disorders along the lines of bulimia and ineffective eating patterns; in contrast, those who worked shifts were those who were more motivated to lose weight – having a general concern about their weight, their

diets and a fear of putting on weight. We have not found more studies along these lines; therefore, for future research, it would be interesting to look again at these aspects and thus be able to establish preventive measures for eating disorders in the health sector.

The results obtained do demonstrate that nursing healthcare staff working shifts have more maladjusted eating behaviours than those who do not work shifts – more specifically, the shift workers are the ones that snack more and skip meals. Fukumura et al. (2015) noted, as in this research, that shift workers are the workers who skip the most meals. Different studies analysed reported of morning anorexia in workers working night shifts and skipping breakfast (Nogareda, 1986; Sudo & Ohtsuka, 2001; Yoshizcki et al., 2010; Patrón, 2012). When shift workers work in structured shifts (both individually and with others), they do not have irregular eating behaviours; however, when they work at night, maladapted eating behaviours can arise like skipping meals (Nogareda, 1986).

Additionally, as has been explained before, in terms of workers' BMI, other factors in addition to the shift work can influence the eating behaviours variable, such as work-related stress (Mejía Ortiz & Manrique Patiño, 2014).

Lastly, in terms of carbohydrate intake (bread, grains, pasta, rice and potatoes), the healthcare workers who did not work shifts consumed more portions than those who did work shifts; this result is in line with the research done by Sudo and Ohtsuka (2001) on workers of the manufacturing industry. In their study, carbohydrate intake was greater for structured daytime workers than workers who worked shifts – even than those who worked nights. In contrast, the study by Cain et al. (2015), found no significant differences in carbohydrate intake in connection with shiftwork; however, it did find that calorie intake was greater in the night-shift group. Wang, Armstrong, and Cairns (2011) stated, through their study on 378 nurses, that shiftwork can be associated with irregular food intake.

In conclusion, it must be said that working shifts is a great barrier for healthy eating habits. Proper food intake and eating behaviours are the main factors that contribute to good health in the long term and to the prevention of chronic diseases; thus, these factors should be a priority in programmes meant to watch out for nursing healthcare staff members' health.

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