



Shift work for healthcare personnel

Turnicidad en el personal sanitario

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ABSTRACT

The objective of the research was to determine the shift work of health personnel who perform shift work at the Hospital General Docente Ambato -Ecuador. A non-experimental, cross-sectional, descriptive and correlational study is presented. A population of 307 health workers including doctors and nurses under three modalities of shifts. Physical Function was found that the personnel working in 24-hour rotating shifts had higher levels of quality of life compared to the 8 and 12-hour groups, between which there were no statistically significant differences. . Women had lower levels of quality of life.

Descriptors: occupational diseases; occupational medicine; work environment. (Source: UNESCO Thesaurus).

RESUMEN

La investigación tuvo el objetivo de determinar la turnicidad en el personal sanitario que realizan trabajo por turnos en el Hospital General Docente Ambato -Ecuador. Se presenta un estudio con diseño no experimental, transversal, descriptivo y correlacional. A una población de 307 trabajadores de salud que incluía médicos y enfermeras bajo tres modalidades de turnos. la Función Física se encontró que el personal que trabaja en turnos rotativos de 24 horas tuvo niveles más altos de calidad de vida en comparación a los grupos de 8 y 12 horas, entre los cuales no existieron diferencias estadísticamente significativas. . Las mujeres presentan niveles más bajos de calidad de vida.

Descriptores: enfermedad profesional; medicina del trabajo; ambiente de trabajo. (Fuente: Tesoro UNESCO).

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Research articles section



INTRODUCTION

The physiological systems of the human organism, such as temperature, metabolism, hormonal axis, among others, are naturally regulated during the 24-hour circadian cycle, with the purpose of favoring the development of intense daytime activities such as cognitive performance and alertness, while this rhythm decreases during the night to optimize physical recovery during sleep, memory fixation, memory, etcetera. Thus, the quality and duration of sleep play a fundamental role in reducing the risks associated with fatigue, concentration and safety. Shift work forces the body to activate when it tends to rest, and the endogenous system fails to adapt to these rapid changes in activity, resulting in a depreciation in the quantity and quality of sleep in 20 to 80% of these workers. This work rhythm results in circadian dyssynchrony, which causes a state of persistent fatigue with multiple physical, cognitive and behavioral decompensations (Tribis-Arrospe, et al. 2020).

Under this premise, when speaking about Quality of Life (QOL), it implies a holistic context that encompasses physical and mental state, lifestyles, housing, workplace satisfaction, economic situation, thus becoming one of the indicators of population well-being. The concept of quality of life arises in the United States after World War II, with the measurement of objective data that failed to fully explain the variation of QoL on an individual basis, it is so that later some psychologists found that QoL not only depends on objective factors, but is influenced by the subjective interpretations that people have of themselves, identifying some indicators such as satisfaction with life and happiness have greater weight than objective factors (Cáceres-Manrique, et al. 2018).

According to (Pineda, & Quero, 2019), the lifestyles of physicians and nurses have a substantial influence on the way they provide health care to patients, influencing the practice of inadequate behaviors for self-care, such as tobacco and alcohol consumption, sedentary lifestyle, stress, mental health alterations, inadequate eating habits that ultimately result in chronic degenerative diseases such as hypertension, diabetes, obesity and other types of behaviors detrimental to health and quality of life. In the study by (Sánchez-Sellero, 2021), it was found that shift work leads to low percentages of job satisfaction and health perception, with the most affected group being night shift workers.

When analyzing the quality of life, it is necessary to consider psychosocial risk as one of the factors with the greatest impact, being appropriate to mention the double presence as a risk to which the female gender is exposed, where there is a direct relationship between the greater number of working hours and those dedicated to housework, in the development of consequences for the mental health of women, decanting in a group with greater vulnerability, however, this will depend on the culture or region, although generally, this is the pattern that is maintained in most countries (Ruiz-López, et al. 2017). The results evidenced will allow decision making by occupational health authorities and managers with significant changes in working conditions and rotating schedules. The effectiveness of these will not only mean the strengthening of workers' health, but also the probability of improvements in the hospital service provided by the health center.

With the above, it is imperative to investigate the effects of shift work on the quality of life of medical and nursing staff, taking into account that, in the Hospital General Docente Ambato, no study of these characteristics has been recorded, so it is possible that the working population (doctors and nurses) is affected in their physical and psychological health. In order to intervene with preventive, curative and rehabilitation mitigation plans, it is necessary to determine the impact of special schedules on health personnel.

Therefore, the objective of this research was to determine the shift work of health personnel who work shifts at the Hospital General Docente Ambato -Ecuador.

METHOD

A non-experimental, cross-sectional, descriptive and correlational study is presented. A population of 307 health workers including doctors and nurses under three shift modalities; the first group with a 24-hour schedule with 3 days off, the second group with 12-hour day shifts and



12-hour night shifts the following day with 3 days off, and the third group with an ordinary 8-hour workday; the SF-36 questionnaire was applied to measure quality of life.

The technique used for the collection of information was the survey through the following instrument: SF-36 questionnaire, in its standard version, which was developed by Ware, et al. at the beginning of the 1990s in the United States, used in the Medical Outcomes Study (MOS). The SF-36 measures eight key concepts of perceived health and well-being over the past 4 weeks: physical functioning; role limitations due to physical health problems; bodily pain; general health; vitality; social functioning; role limitations due to emotional problems (Cordier, et al. 2018). See Table 1.

The SF-36 in its original language showed reliability and face, criterion and construct validity, has been used in more than 40 countries in the international project Quality of life Assessment IQOLA, has been documented in more than 1000 publications, its benefit to assess the burden of disease is described in more than 130 conditions and given its characteristics of brevity and comprehension, it is used considerably worldwide. In the Spanish validation, a Spanish version was obtained which showed complete coincidence with the expected original ordinality, high equivalence with the original values and acceptable reproducibility (Lugo, et al. 2006).

According to (Vilagut, 2005), in most studies, Cronbach's α coefficient exceeded the minimum figure recommended for group comparisons (Cronbach's $\alpha = 0.7$) in all scales, with the exception of social role. The physical role, emotional and physical function scales, obtained the best reliability results, exceeding the value of 0.90 on most occasions. The pooled estimates based on a meta-analysis of all the studies, reached Cronbach's α coefficients ≥ 0.9 for the physical function, physical role and emotional role scales.

The estimates for the other scales exceeded the value of 0.7. In the study by (Aragón, et al. 2017), in which a validation of the SF-36 questionnaire was performed in three cultural contexts in Mexico, it was found that the reliability coefficients ranged from 0.94 to 0.95 for physical role, 0.68 to 0.76 for vitality and 0.92 to 0.94 in social role.

As for its response form, it is considered a Likert-type survey of 4 to 5 options and in certain questions dichotomous answers are allowed, for the final score a range from 0 to 100 is obtained, where 0 is the worst state of health and 100 the best, so that high scores show a better state of health than low scores.

Table 1. SF-36 questionnaire, definition of the dimensions and meaning of the scores.

• ESCALA	DEFINICION	PUNTUACION	
		PEOR PUNTUACION: 0	MEJOR PUNTUACION: 100
Función física	Grado de limitación para hacer actividades físicas tales como el autocuidado, caminar, subir escaleras, inclinarse, coger o llevar pesos y los esfuerzos moderados e intensos	Muy limitado para llevar a cabo todas las actividades físicas, incluido bañarse o ducharse, debido a la salud	Lleva a cabo todo tipo de actividades físicas incluidas las más vigorosas sin ninguna limitación debida a la salud
Rol Físico	Grado en que la salud física interfiere en el trabajo y otras actividades diarias incluyendo rendimiento menor que el deseado, limitación en el tipo de actividades realizadas o dificultad en la realización de actividades	Problemas con el trabajo u otras actividades diarias debido a la salud física	Ningún problema con el trabajo u otras actividades diarias debido a la salud física
Rol Emocional	Grado en que los problemas emocionales interfieren en el trabajo u otras actividades diarias	Problemas con el trabajo y otras actividades diarias debido a problemas emocionales	Ningún problema con el trabajo y otras actividades diarias debido a problemas emocionales



Vitalidad	Sentimiento de energía y vitalidad, frente al sentimiento de cansancio y agotamiento	Se siente cansado y exhausto todo el tiempo	Se siente muy dinámico y lleno de energía todo el tiempo
Salud Mental	Salud mental general, incluyendo depresión, ansiedad, control de la conducta o bienestar general	Sentimiento de angustia y depresión durante todo el tiempo	Sentimiento de felicidad, tranquilidad y calma durante todo el tiempo
Función social	Grado en que los problemas de salud física o emocional interfieren en la vida social habitual	Interferencia extrema y muy frecuente con las actividades sociales normales, debido a problemas físicos o emocionales	Lleva a cabo actividades sociales normales sin ninguna interferencia debido a problemas físicos o emocionales
Dolor Corporal	Intensidad del dolor y su efecto en el trabajo habitual, tanto fuera de casa como en el hogar	Dolor muy intenso y extremadamente limitante	Ningún dolor ni limitaciones debidas a él
Salud General	Valoración personal de la salud que incluye la salud actual, las perspectivas de salud en el futuro y la resistencia a enfermar	Evalúa como mala la propia salud y cree posible que empeore	Evalúa la propia salud como excelente

Source: Adapted from (López-Catalán, *et al.* 2019).

With reference to the statistical tests, two analyses were performed: descriptive and correlational. In the first case, the frequencies and percentages of the variables were calculated, as well as the measures of central tendency and dispersion of the numerical variables through a flat base in the SPSS V25 program.

In order to demonstrate whether the quality of life dimensions showed differences among workers, the scores obtained in the instrument were compared according to gender and workday. Non-parametric tests were chosen for the comparative analysis of the data, since it was not possible to assume the hypothesis of normality according to Smirnov's Kolmogorov statistical test. For the dichotomous variable gender, the Mann Whitney test was used and for the polytomous variable working day (8, 12 and 24 hours), the Kruskal-Wallis test was used. After the analysis of the samples, the recognition of the groups where significant differences were identified was specified, for which the Mann-Whitney U test was applied in pairs as a post hoc procedure.

The level of significance accepted for the studies for all tests was 5%. The analysis process was performed with the Minitab statistical package.

RESULTS

- Of the 307 health professionals who participated in this study, 150 were physicians and 157 were nursing graduates, the average age was 32.06 years and the majority were female (76.22%) and single (53.42%). Regarding work schedules, 31 (10.1%) participants worked regular 8-hour shifts, 190 (61.89%) worked 12-hour rotating shifts and 86 (28.01%) worked 24-hour shifts.
- The 8 domains assessed by the SF-36 scale to evaluate quality of life are presented. The 3 work schedules were compared, showing the lowest levels in the 8-hour workday in the dimensions of Body Pain (61.94), Vitality (62.42), Emotional Role (64.52) and General Health (65.8); for the rest of the domains in general, the mean was higher than 70 in the different work modalities. The physical function and role dimensions in the 24-hour rotating schedule obtained the highest scores with 92.93 and 88.79 respectively. By applying the Kruskal-Wallis statistical test, it was determined whether there were differences between the different groups of work schedules, finding differences in the dimensions of Physical Function, Emotional Role, Pain and General Health.

• In the physical function, there were statistically significant differences between groups ($p=0.017$), so the Mann Whitney U post hoc test was used to prove that the 24-hour schedule differs from the 12-hour schedule; the same was done with the Emotional Role, which indicated a difference



between the different schedules ($p=0.040$), which was confirmed with the post hoc test that showed a statistically significant difference between the 8-hour workers and the other two work shifts. For the Body Pain domain, differences were also found between the 3 study groups, with a value of $p=0.028$, showing in the Mann Whitney test that the results of the 8-hour schedule were statistically different from the other two schedules. Finally, in the perception of General Health, differences were found between the 12 and 24-hour workday, with a P value of 0.027.

Table 2. Statistical analysis of the SF-36 questionnaire by workday.

	HORARIO 8 HORAS (n = 31) X(DS)	HORARIO 12 HORAS (n = 189) X(DS)	HORARIO 24 HORAS (n = 87) X(DS)	Kruskall Wallis	Post-Hoc Mann Whitney P < 0,05	
Función física	86,94 (15,06)	87,17 (16,74)	92,93 (9,62)	0,017	8 HORAS VS 24 HORAS	0,07
					12 HORAS VS 24 HORAS	0,006
					8 HORAS VS 12 HORAS	0,91
Rol Físico	83,87 (33,88)	88,76 (24,78)	88,79 (26,35)	0, 88		
Rol Emocional	64,52 (42,98)	82,01 (33,41)	78,93 (37,74)	0,040	8 HORAS VS 24 HORAS	0,047
					12 HORAS VS 24 HORAS	0,74
					8 HORAS VS 12 HORAS	0,011
Vitalidad	62,42 (18,92)	68,17 (18,24)	67,59 (19,23)	0,363		
Salud Mental	72,90 (18,11)	77,14 (16,96)	75,31 (20,13)	0,496		
Función Social	76,29 (21,08)	79,26 (19,22)	79,60 (22,17)	0,519		
Dolor	61,94 (26,57)	72,34 (22,28)	75,23 (25,02)	0,028	8 HORAS VS 24 HORAS	0,014
					12 HORAS VS 24 HORAS	0,164
					8 HORAS VS 12 HORAS	0,039
Salud General	65,80 (19,45)	67,91 (15,14)	72,01 (16,00)	0,043	8 HORAS VS 24 HORAS	0,063
					12 HORAS VS 24 HORAS	0,027
					8 HORAS VS 12 HORAS	0,37

Source: Own elaboration.

In Table 2, Physical Function, it was found that personnel working 24-hour rotating shifts had higher levels of quality of life compared to the 8- and 12-hour groups, between which there were no statistically significant differences. Regarding the domains of Emotional Role and Pain, the 8-hour shift was the lowest rated, compared to the 12 and 24-hour shifts, between which no differences were found. Finally, in the analysis of General Health, the highest levels of quality of life are maintained in the group of 24-hour workers, compared with the 8- and 12-hour workers who had lower scores, with no differences found between the latter two.



Table 3. Difference in quality of life by gender.

	MASCULINO	FEMENINO	Mann-Whitney
	(n = 73)	(n = 234)	
	X(DS)	X(DS)	P < 0,05
Función física	93,42 (11,36)	87,33 (15,78)	0,00
Rol Físico	86,64 (26,71)	88,78 (26,10)	0,382
Rol Emocional	84,47 (35,17)	77,78 (36,15)	0,036
Vitalidad	68,29 (19,12)	67,16 (18,48)	0,618
Salud Mental	77,66 (17,90)	76,05 (18,09)	0,855
Función Social	78,22 (19,88)	79,32 (20,38)	0,555
Dolor	75,07 (21,71)	71,19 (24,30)	0,341
Salud General	71,78 (16,04)	67,95 (15,84)	0,124

Source: Own elaboration.

In Table 3, it was found that men obtained higher scores in most of the domains compared to women, however, only in the dimensions of Physical Function and Emotional Role, statistically significant differences were found between both groups, with the male gender maintaining the most optimistic values.

DISCUSSION

The dimension of General Health, assesses the personal perception of current health and the perspective of this in the future, that is, if the person believes that their health status will worsen over time, in this study low scores were found in comparison with the other domains, being the 8 and 12 hour shifts the least scored, showing statistically significant differences when compared with the 24 hour shift workers, this finding is supported by the results obtained in the study of (Blanco, et al. 2014), where 1700 workers from different labor sectors in Havana were evaluated, finding that healthcare personnel had the lowest levels in the General Health dimension. While it is true that the scores obtained remain above an average of 50, it is imperative to take into account that, according to the questionnaire inquiry, workers consider that their health will worsen, which supports the importance of recognition and periodic measurement of quality of life as a measure to procure and preserve the health of staff, managing to identify the breaking points that need monitoring and timely intervention.

The lowest levels were recorded in the dimensions of Body Pain, Vitality, Pain and Emotional Role, with scores that do not exceed the mean of 65, when comparing these figures with the study of (López-Catalán, et al. 2019), where when analyzing the quality of life in an Ecuadorian population in the city of Cuenca, in the group of people with higher education, they obtained scores much higher than those of this study, being the lowest of 71 in the Vitality dimension, which indicates an evident gap between both populations, assuming a considerable affectation of the quality of life in the health personnel who participated in this research.

In relation to gender, men presented higher scores than women, finding statistically significant differences in the dimensions of Physical Function and Emotional Role, data that are congruent with the research of (López-Catalán, et al. 2019), where in their analysis they evidence the same trend in these two groups, attributing these results to sociocultural factors that indicate that household chores performed by women could influence a lower availability of time and resources for self-care.



CONCLUSION

From the results obtained it can be concluded that workers with an ordinary 8-hour workday show statistically significant differences with the lowest quality of life scores in the domains of Physical Function, Emotional Role, Pain and General Health, being the workers who perform 24-hour shifts, who reached the highest scores, obtaining contradictory findings to the aforementioned studies that indicate the repercussion that shift work has on physical and mental health, being imperative to carry out a follow-up and a new research of explanatory type that allows to identify the causes or aggravating factors that influence the workers of an ordinary 8-hour workday; At the same time, it is necessary to implement preventive measures such as the rotation of the personnel's working hours with a subsequent evaluation to verify the effectiveness of the intervention. Women present lower levels of quality of life, finding statistically significant differences in the dimensions of Physical Function and Emotional Role, which may be attributable to the theory of double presence that indicates the negative effect on physical and mental health of the workload associated with hours of unpaid housework.

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CONFLICT OF INTEREST

There is no conflict of interest with persons or institutions related to the research.

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