

Association of Long Duty Hours and Unhealthy Dietary Habits among Nurses at Private and Public Sector in Karachi, Pakistan

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ABSTRACT

OBJECTIVE: To determine the associations between long duty hours and unhealthy dietary habits among nurses at private and public sector in Karachi, Pakistan

METHODOLOGY: In this cross-sectional analytical design 300 nurses were randomly selected from private and public hospitals between months of October to December 2017. The data was collected through structured questionnaire developed by Aryee PA 2013 containing two portions. The first part asks about the demographic data including age, sex, marital status and ethnicity, whereas, the second part asks about the anthropometry, job schedule, physical activity and dietary habits of the respondents.

RESULTS: The mean age of 300 study subjects was 30.78 ± 8.47 years. Among them 61% nurses were working as long duty hours. Nurses working in private sectors are more involved in the long duty hours rather than nurses working in public sectors. Body Mass Index (BMI) of nurses was significantly relevant with the long duty hours (P-value < 0.05). The mean BMI of nurses with long duty hours were $BMI = 25.78 \pm 7.35$. Long duty hours were associated with skipping meal through Mann Whitney U test, which was significant with P-value < 0.05 . BMI and age of participants was negatively correlated with duty hours i.e. -0.116 & -0.239 respectively.

CONCLUSION: In conclusion, long duty hours are associated with the unhealthy dietary habits of the nurses. The study recommended that nurses must reflect on their dietary habits to stay healthy and prevent from non-communicable diseases. Nurse Managers should work efficiently so workload of nurses could minimize and could reduce their duty hours.

KEYWORDS: Long duty hours; unhealthy dietary habits; nurses; skipping meals; non-communicable diseases; Pakistan

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INTRODUCTION

Long duty hours or extended hours of work are generally defined as mean working hours more than 40 hours a week¹. Researchers have labeled long shift working hours as the contributing factors for nurses to have overweight and obesity². Moreover, many researchers associated it with the unhealthy dietary habits of nurses, it was identified that working schedule has many influences on person's dietary habits³. Long shift working hours causes negative effect on nurse's health. It could lead job related stress, poor job performance, insomnia and disrupted social and family life. Furthermore, it is reported that high risk factors such as obesity, overweight, physical inactivity, and poor eating habits are associated with shift and rotational night shift works^{4, 5}. Many researchers associate obesity among nurses with their long working hours and overload of work. Zhao I 2011⁵ conducted a cross sectional study to examine association between shift work and unhealthy weight among female nurses and midwives. Another study highlighting the association of shift work with obesity

hypothesized the shift work as a risk factor for obesity in female nurses in Korea⁶.

The irregular dietary habits, physical inactivity other than work has dreadful effect on nurses, due to which nurses are having an increased risk for non-communicable diseases with the high prevalence of obesity⁴. Aryee PA 2013⁷ highlighted that the overburden of nurses is contributing to the development of obesity due to adapting to the unhealthy lifestyle and behaviors. Many researchers have conducted studies to associate poor dietary habits and different working shifts, like morning and night shift duties among health workers. Furthermore, they also made association with different health conditions like metabolic syndrome, type2 diabetes and cardiovascular disorders^{3, 8}. Researchers from Asian countries reported same issue but the studies conducted over there concluded no difference of dietary habits⁸. On the other hand, few researchers have mentioned that shift workers have more unfavorable dietary habits compared to day workers⁹. Moreover, it is highlighted that nurses working in

shifting duties have different dietary habits and food selection⁸. Furthermore, these poor dietary habits at work are likely to be a continuum of those habits acquired during childhood and early adulthood¹⁰. Long working hours, shift work, availability of fast food, eating in responses to stress as a maladaptive coping convenience, environmental factors and nature of food outside the working hours⁸⁻¹², may all or in part contribute to the observed poor dietary habits among HCWs and can affect their productivity negatively¹³⁻¹⁵. Researchers have identified that workload, inadequate regular break, and difficult access to healthy food can affect their dietary habits and labeled as the barriers of healthy dietary habits¹⁶. Healthy dietary habits influence positively the ability of the physicians to care for their patient and healthcare organizations should adopt more proactive approaches to the wellness of their healthcare workers as many physicians around the globe usually fail to adopt healthy dietary habits at work^{2,17}. As highlighted in the above-mentioned literature that there is limited literature available on the association of overweight and obesity among nurses and their working hours. Especially in Pakistan there is no data available to identify the association of unhealthy dietary habits and their long duty hours. Therefore, the aim of the study was to determine the associations between long duty hours and unhealthy dietary habits among nurses at private and public sector in Karachi, Pakistan.

This study has immense significance towards nursing profession, therefore this study fills the gap of the literature. Secondly, this study would serve as a source of information for health policy formulation in the management of unhealthy dietary habits among health professionals. Thirdly, this study helps nurses to reflect themselves and identify their own unhealthy dietary habits. Finally, yet importantly, study is alarm for nurse managers to work on this area to maintain the healthy nurses.

METHODOLOGY

This cross-sectional analytical study design was to identify the association between long duty hours and unhealthy dietary habits of nurses working at private and public hospitals in Karachi, Pakistan. The data collected from Ziauddin group of hospitals and Jinnah Postgraduate Medical Center hospital (JPMC) between months of October to December 2017. All nurses working at private and public hospital regardless of gender and working experience were included in the study.

The permission is granted from the primary researcher to use this questionnaire. The data was collected after approval from the Clinical Research Committee

(CRC), Ethical Review Committee (ERC), Board of Advanced Studies and Research (BASR), and hospital administrations. Written consent was taken from all participants.

The data was collected from 300 nurses by using questionnaire developed and used by Aryee PA 2013⁷ containing two portions. The first part asks about the demographic data of the respondent which includes their age, sex, marital status and ethnicity. Whereas, the second part of the questionnaire asks about the anthropometry, job schedule, physical activity and dietary habits of the respondents. The data was analyzed using SPSS version 22. The demographic variables such as gender, marital status, ethnic group and religion are expressed in frequency and percentage. Age, height and weight are presented in term of mean \pm SD. Chi-square and Mann U Whitney test were applied to associated different variables.

All nurses working at private and public hospital regardless of gender, working experience and shifts were included in the study. Nurses at the management post and not involved in the practice area were excluded. Furthermore, interns and nurses in resignation period were also excluded.

In this cross-sectional study participants were recruited by simple random sampling method with fish ball method. Furthermore, WHO Software named as "sample size determination in health Sciences" was used for sample size calculation. The prevalence of overweight and obesity among the nurses were 26.4% and 16.9% respectively stated in this study. For the sake of maximum collection of information, 26.4% prevalence was picked which gave sample size 299 by considering 95% confidence level and 5% bound of error.

RESULTS

Description of Age, Gender, Qualification and Working Hours

In this study total 300 nurses participated from private and public hospitals. The mean age of study subjects was recorded as 30.78 \pm 8.47 years of age, 184 (61.3%) nurses were female, 153 (51%) nurses were single, 189 (63%) nurses marked their last qualification "RN" that is registered nurses, while 71 (23.7%) nurses were BScN qualified. Furthermore, 40 (13.1%) nurse's qualification was RM that is registered midwife. 152 (50.7%) nurses had working experience 'less than 5 years', 75 (25%) nurses had working experience between 5-10 years, 36 (12%) nurses have working experience between 11-15 years and 18 (6%) nurses have experience between 16 to 20 years. Working experience of more than 20 years also mentioned by 19 (6.3%) nurses. 227 (75.7%) nurses perceived their family member as fat or obese.

Participants working 40 hours per week with two days off defined as normal duty hours. Above 40 hours per week classified as long duty hour, 59% participants were doing their normal scheduled duties and others were engaged in long duty hours.

Mean Body Mass Index

Variables	Scheduled duty hours	Long duty hours	P-value
BMI	25.78±7.35	23.8350±5.394	0.013*

The mean body mass index of nurses working in scheduled duty hours was 25.78±7.35 that is higher than the nurses in long duty hours that is 23.8350±5.394. To identify relationship among mean BMI and Duty hours Mann-whitney U test. Mann-whitney U test is generated to compare the mean BMI in different groups of nurses with respect to duty hours i.e. scheduled duty hours & long duty hours (P-value <0.05 considered as statistically significant).

Significance mean difference in BMI was detected between two different groups of nurses with respect to duty hours i.e. P-value is 0.013. The nurses who worked other than scheduled duty hours have less BMI (23.8350±5.394) than nurses who did not have long duty hours (BMI=25.78±7.35) due to their unhealthy dietary habits.

Unhealthy Dietary Habits

Unhealthy dietary habits were assessed through skipping meals by nurses, talking fruits or snacks during duty hours and increasing junk eating habits. The unhealthy dietary habits were than compared with long duty hours to find association among variables.

Association of Long Duty Hours with Skipping Meals in Nurses

First of all, association was made among the duty hours and skipping of meal as shown in **Table I**. In **Table I** cross tabulation presented that out of 300 nurses, 124 nurses were doing long duty hours job in which 65 (56.5%) were skipping their meals as well. To find out the association between long duty hours and skipping meals, chi-square test was applied by considering P-value <0.05 as statistically significant. The chi square is non-parametric test was applied on the nominal independent variable.

TABLE I: DEMOGRAPHIC CHARACTERISTICS OF STUDY SUBJECTS

Variables		N (%)
Gender	Male	116 (38.7)
	Female	184 (61.3)
Marital Status	Single	153 (51)
	Married	146 (48.7)

	Widow	01 (3)
Any family member perceived as fat or obese	Yes	73 (24.3)
	No	227 (75.7)
Qualification	RN	189 (63)
	RM	40 (13.1)
	BScN	71 (23.7)
	Midwife	02 (0.7)
	Less than 5 years	152 (50.7)
Working Experience	5-10 years	75 (25)
	11-15 years	36 (12)
	16-20 years	18 (6)
	More than 20 years	19 (6.3)
Working Sector	Public	150 (50)
	Private	150 (50)
Duty Hours	Normal	176 (59)
	Long duty hours	124 (41)

The data suggest that $\chi^2(1) = 17.74$, P-value <0.05, shows statistically significant association between skipping Meals and long duty hours i.e. habit of skipping meals was found at greater extent in the group of nurses doing long duties as compared to scheduled duty hours nurses.

To explore further mean difference of duty hours between having meals and skipping meals group of nurses, Mann Whitney U test was generated due to violation of normality test over given data. It is concluded that there is a significantly mean difference in duty hours observed between the groups of nurses who skip their meals and have their meals i.e. P-value < 0.05. Mean value of duty hours is 2.88±2.91 in meal skipping nurses group which is higher than mean value of duty hours of having their meal nurses group which is 1.46±2.48.

Association of Duty Hours with Fruits and Snacks Intake in Nurses

The data of the study further classified in the duty hours and intake of fruits and snacks in the nurses. The **Table II** shows cross tabulation is illustrating the distribution of study subjects with respect to duty hours with fruits and snacks intake, 109 nurses are engaged in long duty hours and fruits, snacks are included in their meal. In contrast, maximum number of participants that are 136 (55.5%) working in scheduled working hours and having fruits, snacks intake too. To associate the variables duty hours and the intake of fruits and snacks in the nurses Chi-square test

applied. Chi-square test was generated for the sake of finding the association between duty hours with fruits and snacks intake. P-value <0.05 considered statistically significant.

TABLE II: CROSS TABULATION OF LONG DUTY HOURS WITH SKIPPING MEALS

Duty Hours	Skipping meals		Total	P-value
	Yes	No		
Long duty hours	65 (56.5)	59 (31.9)	124	<0.05*
Scheduled working hours	50 (43.5)	126 (68.1)	176	
Total	115	185	300	
Duty Hours	Fruits and snacks intake		Total	P-value
	Yes	No		
Long duty hours	109 (44.5)	15 (27.3)	124	0.019*
Scheduled working hours	136 (55.5)	40 (72.7)	176	
Total	245	55	300	

$\chi^2(1) = 5.491$, $P\text{-value}=0.019$ expresses that statistically significant association between fruits and snacks intake and long duty hours is existed. It could be stated that those nurses who undertaking scheduled duty hours are more likely to have fruits and snacks intake 136 (55.5%) as compared to the group of long duties nurses 109, (45.5%) **Table III**. Instead of independent sample T-test (due to violation of normality test over given data), Mann Whitney U test is run to search further mean difference of duty hours between two different groups with and without fruits and snacks intake. Significantly mean difference in duty hours is perceived between them i.e. P-value

TABLE III: CROSS TABULATION OF DUTY HOURS WITH FRUITS AND SNACKS INTAKE

Duty hours	Fruits and snacks intake		Total
	Yes	No	
Long duty hours	109 (44.5)	15 (27.3)	124
Scheduled working hours	136 (55.5)	40 (72.7)	176
Total	245	55	300

TABLE IV: CROSS TABULATION OF DUTY HOURS WITH INCREASING EATING HABIT

Duty hours	How many times do you eat in a day?					Total	P-value
	One	Two	Three	Four	Five		
Long duty hours	02 (66.7)	26 (53.1)	75 (35.7)	19 (52.8)	02 (100)	124	0.026*
Scheduled working hours	01 (33.3)	23 (46.9)	135 (64.3)	17 (47.2)	0	176	
Total	03	49	210	36	02	300	

=0.013. Higher mean value of duty hours is observed in the group of nurses with fruits and snacks intake i.e. 2.19 ± 2.82 as compared to the mean value of duty hours of nurses who miss fruits and snacks 1.16 ± 2.14 .

Association of Duty Hours with Increasing Eating Habit in Nurses

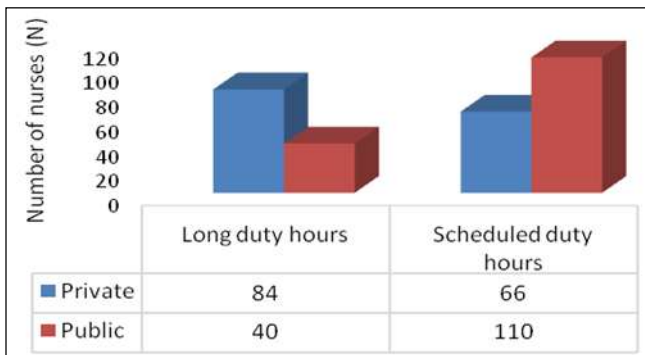
The duty hours of the nurses further associated with their increasing eating habits. The **Table IV** cross tabulation is presenting the classification of duty hours of nurses with how many times they eat in a day. Maximum numbers of study subjects were having their meals thrice a day i.e. 210 (70%). In which most of the nurses 135 (64.3%) are employed in scheduled working hours and rest are performing their duties in other than scheduled working hours as well i.e. 75 (35.7%). Only 2 nurses mentioned that they eat five times a day and both are parts of long duty hour's group of nurse.

Chi-square test was applied for checking the association of duty hours of nurses with how many times they eat in a day by considering P-value < 0.05 as statistically significant. P-value=0.026 proved that there is significant association between the duty hours of nurses and how many times they eat in a day. Highest mean value of duty hours was observed among nurse who eat five times a day even though lowest mean value of duty hours was recorded in the group of nurses who eat three times a day i.e. 6.50 ± 2.12 and 1.67 ± 2.561 respectively.

Classification of Study Subjects W.R.T Working Sector and Duty Hours

The data of the participants further classified among the working sectors that are public sector and the private sector. The associations were made among duty hours and the working sectors of the nurses. In **Figure, I** drawn multiple bar chart distributed data according to working sector in different duty hours of nurses. It is much cleared that most of the nurses with long duty hours are performing their duties in private hospital i.e. 84 (67.7%) out of 124 (total number of long duty nurses). Likewise, nurses with scheduled duty hours i.e. 110 (62.5%) out of 176 (total number of scheduled duty hours nurses) are on government payroll.

FIGURE I: CLASSIFICATION OF STUDY SUBJECTS W.R.T WORKING SECTOR AND DUTY HOURS



To elaborate the association of working sector and duty hours, here we applied chi-square test by taking P-value <0.05 as statistically significant. After getting output from software; which is $\chi^2=26.613$, P-value <0.05, It could be stated that there is significant association exist between them.

Association of Working Sectors of Study Subjects and Different Variables

The association was made among nurses in public and private sector with the different variables. The association of Fruits and snacks intake, and eating habits are not statistically significantly associated with working sector of participants i.e. P-values are 0.059 and 0.654 respectively. On the other hand, skipping meals in nurses is significantly associated with their working sector i.e. P-value= 0.006. Nurse of private hospital 69 (46%) are more likely to skipping meals as compared to the public hospital's nurses 46 (30.7%).

DISCUSSION

Demographic Data of the Study

As it was mentioned in the result section 300 nurses from private and public hospitals participated in the study. Equal numbers of the participants were selected from both sectors. The demographic data reveals that the minimum age of participant was age 18 years and maximum age was 58 years old. There were 61.3% nurses were female and 51% nurses were single. Furthermore, their data was categorized according to qualifications which revealed that 63% nurses were diploma qualified, 23.7% and nurses were BScN qualified. Most of the nurse's working experiences were less than five years. In Pakistan, no similar kind of study has been conducted anywhere. A study in Karachi was conducted to identify the overweight and obesity among undergraduate nursing students of Karachi.

Long Duty Hours and Body Mass Index

The data of the current study revealed that 41% nurses are working with long duty hours. This means

they are working more than 48 hours per week. Furthermore, in the current study comparison was made between BMI and the long duty hours. The current study data revealed that there was significant association between long duty hours and the BMI of the nurses. The data clearly state that nurses working with long duty hours has less BMI than the nurses working with normal duty hours. Furthermore, nurses working with long duty hours have BMI ranged between 18.44 and 29.22. According to WHO, BMI under 18.5 is stated as underweight, BMI between 25 to 29 are stated as overweight, whereas, BMI greater than 30 is labeled as obese. In the current study half of the nurses had normal weight whereas, half of the participants that is 150 nurses were either underweight or having overweight or obese. 24 nurses were underweight from that 14 nurses were working in long duty hours. Whereas, 126 nurses fall under overweight or obese category from which 82 nurses were working with long duty hours. The current study results could also be compared with the results of the study conducted by Duodu C 2015¹⁸ also identified that 31.8% nurses participated in the study was obese. Similarly, Kim MJ et al⁶ study has the similar results that half of the nurses was with normal BMI, whereas, 26% nurses were overweight and obese. Furthermore, Kim MJ et al⁶, endorsed that the duration of the shift work is positively associated with the Overweight and obesity among nurses in Korea. On the contrary other study has identified 53% nurses as overweight and obese in Nigeria²⁶.

Long Duty Hours and Unhealthy Dietary Habits

In the unhealthy dietary habits the data of long duty hours was compared with the skipping meals, intake of fruits and snacks, increasing eating habits. The results of the current study highlights that, nurses have poor dietary habits especially working in long duty hours. Similarly, studies conducted at Saudi Arabia stated the same result indicating poor dietary habits shown by the health workers working in shifting duties¹⁹. Their poor dietary habits impact on their health in terms of keeping them on risk of developing non-communicable diseases. Studies have highlighted that poor dietary habits have been identified as the modifiable risk factor to develop obesity secondary to diabetes, cardiovascular diseases and metabolic syndromes²⁰⁻²⁴.

In this study, many nurses are skipping their meals due to long duty hours. Furthermore, nurses working in long duty hours are not taking fruits as their snacks they mostly eat junks more than one time during their duty hours. Researchers have studied the reasons of skipping meals and not taking fruits as their snacks. Few reported no scheduled small breaks while duty hours; secondly nurses are overburdened in terms of

caring patients and maintaining documents, finally unavailability of healthy food at their work place^{19,25,26}. Unhealthy dietary habits are like addictions. Although nurses know that unhealthy dietary habits may lead them to severe consequences, mostly nurses working in stress, in long duty hours has no option where unhealthy foods are also not available for them^{27,28}. In this study 45.5% nurses are working in long duty hours and not taking fruits as their snacks. This finding is alarming, studies identified similar findings and suggested that management should work and rethink over this matter seriously^{29,30}.

CONCLUSION

The study made association between long duty hours and unhealthy dietary habits among nurses working in the public and private sectors of Karachi, Pakistan which has not been studied earlier, therefore it provides the baseline data regarding the long duty hours of nurses and its association with the unhealthy dietary habits. In this current study participants of the study were recruited from one public and private sector that could limit the generalizability of the findings.

RECOMMENDATIONS

The study recommended that all nurses and midwives must reflect their dietary habits in order to stay health and prevent themselves from non-communicable diseases. Ongoing sessions must arrange to highlight the health of nurses and promote healthy dietary plan for nurses on duty. Management should reflect the on schedule they made to avoid over burden and long duty hours. Furthermore, it is recommended that nurse researchers must work on this issue in future to identify other aspects of the unhealthy dietary habits among nurses.

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