

A descriptive study on Non Communicable Disease among nursing personals in a Medical Teaching Institute, Kolkata

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Abstract

Background- Nursing personnel are one of the important man power in health system. India has 1.7 nurses per 1,000 population, 43% less than the World Health Organisation norm. This creates a huge workload on Nurses. Due to busy schedule and night shift, physical activity was less among them which leads to obesity and other Non-Communicable Disease (NCD). Very few study was conducted in India in this aspect. With this background present study was conducted to find out proportion of NCD and association of different factors with NCD. **Methods** – Institutional based cross sectional study was conducted in a Medical Teaching Institute in Kolkata from January 2021 to March 2021. Sampling was done by complete enumeration and total 545 nurses were interviewed by a pre-designed, pretested structured questionnaire. Descriptive statistics such as frequency, percentage, mean, and standard deviation were used to describe the demographic profiles of respondents, the level of awareness, and the extent of practice. Chi-square test was applied to study the association and p-value obtained. Logistic regression was done to find out odds ratio. The p-value of less than 0.05 was considered statistically significant. **Results** - Proportion of any one non communicable disease was 23.2%. Majority of population belonged to 23-35 years age group, married, Hindu, Residing in nuclear family in Urban area and had GNM qualification. Age, education, caste, marital status, work load, obesity, anxiety and stress had significant association with NCD profile. **Conclusion:** Regular physical activity should be performed to prevent development of NCDs. Periodic medical check-up of nursing personnel should be conducted for early diagnosis of NCDs. Importance should also be given on workplace stress reduction.

Key words: Non-Communicable Disease; Nurse; Stress.

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Introduction

Nursing personnel are one of the important man power in health. In the face of budgetary constraints and increasing demand for healthcare, there are persistent and growing shortages of registered nurses (RNs). [1] Many hospitals rely on unregistered nursing assistants to deliver a substantial proportion of 'hands on' care. The proportion of fully trained RNs delivering care on hospital wards in India is already among the lowest. Recruitment and retention difficulties, combined with ongoing government austerity measures, are set to increase pressure to reduce both the absolute numbers of staff deployed on the wards and the number of RNs relative to the number of nursing assistants. [1-3] However, both reducing the RN workforce and substitution of nursing assistants for RNs have been questioned on the grounds of adverse effects on patient safety. [4] As nurses are exposed to physical health demands and high levels of stress in their occupations. Workplace environments characterized by high job demands, intensity in care delivery, job burnout, and loss of staff due to health issues, have resulted in a continuum of health disruption for health care worker. [5, 6] The World Health Organization defined health as a state of complete physical, mental, and social well-being and not merely the absence of disease. [7] Physical health incorporates physical

activity, nutrition, and recovery. Physical activity has been defined as "bodily movement produced by skeletal muscles that require energy" and exercise as a type of planned, structured, and repetitive activity to maintain or improve physical fitness. [8] While the recommendation of 150–300 minutes per week of moderate intensity physical activity on most days of the week is required to maintain health, it has been reported that not all health care workers are meeting this minimum requirement. [9, 10] High prevalence of overweight and obesity has been reported in health care workers. [11] Fifty percent of a paramedic's shift is spent sitting, contributing to obesity. Further, night-shift health care workers have been reported to have a higher cumulative incidence of metabolic syndrome (9.0%) compared with daytime workers (1.8%). [12] Furthermore, being overweight has been related to an increased incidence of musculoskeletal injuries among health care workers. [13, 14] India has 1.7 nurses per 1,000 population, 43% less than the World Health Organisation norm (3 per 1,000). This includes nurses, midwives, women health visitors and auxiliary nurse midwives. Overall, India has 3.07 million registered nursing personnel on March 3, 2020 and 111691 in West Bengal as on 1st January, 2016. This contest could be aggravated by the form of work organization as a result of the exercise of power performed by the several participants involved in health organizations. In the hospital environment, activities are frequently characterized by fragmented division of tasks, rigid hierarchical structure to meet routine requirements and understaffing in quantitative and qualitative terms. In addition, the strain caused by work requirements may lead to chronic and acute physiological responses, psychological reactions and behavioral changes and a

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possible decrease in functional capacity and work ability. Strain can also have an immediate effect, namely fatigue. This could be the result of occupational activities that require intense physical and mental activity associated with organizational stressors. Prolonged working hours, night jobs and double shifts stand out among these stresses. Though several studies indicated NCD of nursing personnel in connection with their working condition, work organization, work ability, perception of fatigue, sickness absenteeism, anxiety, depression, stress, self-reported health and sleep complaints etc. at international level, but very few studies have been reported at national level and no such study has been reported particularly in West Bengal. Only a comprehensive study on nursing personnel can help in understanding of the health status and occupational differentials of nurses along with their actual Non Communicable Diseases determinants which in turn help to modify the existing health care delivery services or even to design more appropriate strategies for their overall development.

Methods

Institutional based cross sectional study was conducted in a Medical Teaching Institute in Kolkata, to find out proportion of NCD and association of different factors with NCD. Study period was January 2021 to March 2021. All categories of nursing personnel including Nursing Superintendent, Deputy Nursing Superintendents, Ward Sisters & Staff Nurses discharging services in this institute were the study population. All nursing personnel working in this institute at least one year were included in this study & those were absent during data the entire period of data collection and those were unwilling to participate were excluded from this study. The study was conducted as complete enumeration method. At the time of completion of data collection total number of nurses working in this institute was 568 (Nursing Superintendent - 2, Deputy Nursing Superintendent -12, Ward Sister - 70 & Staff Nurse- 484). Among the staff nurses four individuals were on long leave, fourteen nurses had work experiences less than one year & five were unwilling to participate in this study. Finally sample size become 545. A pre-designed, pretested structured interviewer administered questionnaire was used in this study. Stress was assessed with DASS 21 scores. The face validity of each item and content validity of each domain were ascertained by them. Pretesting was done among 30 nursing personnel in another but similar hospital. The questionnaire included three parts. The first part involved demographic profiles of the respondents. The second part consisted of occupational differentials like work load (current), work load (history). Last part of the questionnaire content NCD risk factors like anthropometry, body mass index, blood pressure, postprandial blood sugar. Post Prandial blood sugar was checked on the day of data collection. The Statistical Package for Social Sciences (SPSS) Version 16 was used for analysis. Descriptive statistics such as frequency, percentage, mean, and standard deviation were used to describe the demographic profiles of respondents, the level of awareness, and the extent of practice. Chi-square test was applied to study the association and p-value obtained. Logistic regression was done to find out odds ratio. The p-value of less than 0.05 was considered statistically significant.

Ethical Considerations

Approval was secured from the institution where the study was conducted, and from the institution's Ethics Review Committee. The nurses were given a detailed explanation about the nature and the purpose of the study. It was emphasized that participation was voluntary, and that participation in the study would have no influence on either their coursework grade or clinical requirements. Informed verbal consent was secured and all data sheets were kept confidential and anonymous.

Results

In the present study majority of population belonged to 23-35 years age group, married, Hindu, Residing in nuclear family in Urban area and had GNM qualification (Table 1). Proportion of

any one non communicable disease was 23.2%. In present study age had significant effect on NCD profile and those belonged to age above 35 years had higher prevalence of NCD [OR = 7.93 (5.19-12.11)]. Education had significant effect on NCD profile and those having qualification B Sc or M Sc in nursing had higher prevalence of NCD [OR = 1.97 (1.26-3.07)]. Caste had significant effect on NCD profile and those belonged to other caste had higher prevalence of NCD [OR = 2.38 (1.54-3.66)]. Marital status & having children both had significant effect on NCD (one year) profile and those were married and having children had higher prevalence of NCD [Marital status :OR = 1.99 (1.29-3.06); Having children: OR= 3.34(1.95-5.74)]. Type of family had no significant effect on NCD profile of the respondents. Work load had significant effect on NCD profile and those having history of more work load had higher prevalence of NCD [OR = 8.17 (5.41-12.34)]. Travails of travel had significant effect on NCD profile and in presence of travails of travel" prevalence of NCD was also higher. [OR = 1.89 (1.32-2.70)]. BMI had also significant effect on NCD (one year) profile and those who were obese or over weight had higher prevalence of NCD [OR = 2.87 (1.98-4.15)]. Knowledge of NCD and physical exercise had no significant effect on NCD (Table 2). In this study age had significant effect on BMI and those belonged to age above 35 years had higher prevalence of over-weight & obesity [OR= 3.18 (2.19-4.64)]. Marital status & having children both had significant effect on BMI profile and those who were married and having children had higher prevalence of over-weight or obesity.[OR: Marital status: 3.89 (2.37-6.48); Having children: OR: 1.69 (1.04 -2.74)]. Work load had significant effect on BMI and those having history of more work load had higher prevalence of over-weight & obesity [OR: 2.92 (2.02-4.21)]. Blood sugar level & blood pressure both had significant effect on BMI and those having blood sugar level > 140 mg/dl & suffering from hypertension respectively had higher prevalence of over-weight & obesity Blood sugar: OR: 2.58 (1.55-4.10); Blood pressure: OR: 8.05 (5.02-12.90) respectively. Stress had significant effect on BMI and respondents who showed more stress score all had higher prevalence of over-weight & obesity [OR: 2.48 (1.71-3.59)] (Table 3). Age & marital status had significant effect on hypertension and those belonged to age above 35 years & married had higher prevalence of hypertension [Age: OR: 7.16 (4.13 - 12.42); Marital status: OR: 2.42 (1.37-4.29) respectively]. Work load had significant effect on hypertension and those having history of more work load had higher prevalence of hypertension [OR: 6.46 (3.87-10.79)]. Blood sugar level & BMI both had significant effect on hypertension and those having blood sugar level 140 mg/dl & suffering from obesity respectively had more prevalence of hypertension [Blood sugar: OR: 3.29 (1.97-5.48) & BMI: OR: 8.05 (5.02 -12.90) respectively]. Anxiety & Stress had significant effect on BMI and those who suffered from anxiety & stress had more prevalence of hypertension [Anxiety: OR: 3.81 (1.92-7.55) & Stress: OR: 7.50 (4.72-11.91) respectively]. Depression had no significant effect on hypertension (Table 4). Age had significant effect on blood sugar level and those belonged to age above 35 years had higher prevalence of blood sugar level \geq 140 mg/dl than their counterpart of < 140 mg/dl. [OR: 1.81 (1.10-2.97)]. Work load had significant effect on blood sugar level and higher odds of blood sugar level 140 mg/dl was found with more work load (history) [OR: 2.28 (1.38-3.77)]. Blood pressure & BMI both had significant effect on blood sugar level and those suffering from hypertension & obesity/over-weight showed higher prevalence of blood sugar level \geq 140 mg/dl [Blood Pressure OR: 3.29 (1.97-5.48); BMI: OR: 2.52 (1.55 4.10)] Stress had significant effect on blood sugar level and participants showed higher odds of blood sugar level \geq 140 mg/dl with presence of stress. [Stress: OR: 10.65 (5.98-18.97)]. Marital status, depression and anxiety had no significant effect on blood sugar level \geq 140 mg/dl (Table 5).

Table 1: Socio-demographic profile of study participants. n=545

Variable	Category	No. (percentage)
Age (in years) [Median: 35; IQR (46); Mean (SD): 37.5 (\pm 10.4); Range: 23 -59]	23 - 35	283 (51.9)
	36 - 45	121 (22.2)
	46 - 55	95 (17.5)
	56 - 59	46 (8.4)
Educational status	GNM	449 (82.4)
	B Sc (Nursing)	82 (15.0)
	M. Sc (Nursing)	12 (2.2)
	ANM	2 (0.4)
Religion	Hindu	500 (91.7)
	Muslim	07 (1.3)
	Christian	19 (3.5)
	Others	19 (3.5)
Caste	Schedule Caste	94 (17.2)
	Schedule Tribes	35 (6.4)
	Other Background Classes	23 (4.2)
	Others	393 (72.1)
Permanent place of residence	Urban area	497 (91.1)
	Rural area	48 (8.9)
Type of family	Nuclear	382 (70.1)
	Joint	163 (29.9)
Marital status	Married	403 (73.9)
	Unmarried	132 (24.2)
	Widow	4 (0.7)
	Separated	2 (0.4)
	Divorced	4 (0.7)
Age of Marriage (in years) [Median: 27.0; Mean (SD): 27.1 (\pm 3.4); Range: 20 - 45] (n=413)	20 - 25	154 (37.5)
	26 - 30	199 (48.2)
	31 - 35	54 (13.1)
	36 - 40	4 (1.0)
	41 -45	2 (0.4)
Age of 1 st child birth (in years) [Mean (SD): 29.2 (\pm 3.1); Range: 20 - 40] (n=316)	22 – 27	97 (30.7)
	28 – 32	172 (54.4)
	33 – 37	42 (13.3)
	38 - 40	5 (1.6)
Number of living children (n=413)	0	97 (23.5)
	1	236 (57.1)
	2	80 (19.4)
Addiction	Yes	10 (1.8)
	No	535 (98.2)

Table 2: Effect of Socio-demographic and other relevant factors on NCD of the study subjects (n = 545) (Univariate logistic regression analysis)

Variable	Presence of NCD	
	Number (%)	OR ((95% CI)
Socio-demographic:		
Age (in years)		
• \leq 35 (262)	36 (13.7)	
• >35 (283)	158 (55.8)	7.93 (5.19 - 12.11)*
Education		
• GNM (449)	147 (32.7)	
• BSc/MSc (96)	47(48.9)	1.97 (1.26 - 3.07)*
Caste		
• SC/ST/OBC (152)	34 (22.3)	
• Others (393)	160 (40.7)	2.38 (1.54 - 3.66)*
Marital status:		
• Unmarried/Separated/Divorcee (142)	35 (24.6)	
• Married (403)	159 (39.4)	1.99 (1.29 - 3.06)*
Having children: (n= 413)		
• No (97)	20 (20.6)	
• Yes (316)	147 (46.5)	3.34(1.95 - 5.74)*
Type of Family		
• Joint(163)		
• Nuclear(382)	52 (31.9)	1.26 (0.85 - 1.86)
Occupational differentials:	142 (37.1)	

Work load (history)		
• Less (282)	41 (14.5)	8.17 (5.41 - 12.34)*
• More (263)	153 (58.1)	
Work load (current)		
• Less (382)	141 (36.9)	0.82 (0.55 - 1.21)
• More (163)	53 (32.5)	
Travails of travel		
• Absent (324)	96 (29.6)	1.89 (1.32 - 2.70)*
• Present (221)	98 (44.3)	
Life style:		
BMI		
• Underweight & Normal (355)	96 (27.0)	2.87 (1.98 - 4.15)*
• Overweight & Obese(190)	98(51.5)	
Physical Exercise		
• Yes (175)	62 (35.4)	1.01 (0.69 - 1.47)
• No (370)	132 (35.6)	

Significant at 95% confidence interval

Table 3: Univariate & multivariable logistic regression analysis for effect of factors on body mass index of the study subjects (n-545)

Variables	Presence of overweight & obese		
	Number (%)	OR (95 % CI)	AOR (95 % CI)
Socio-demographic:			
Age (in years)			
≤ 35 (262)	57 (21.7)	3.18 (2.19 - 4.64)*	1.45 (0.69-3.04)
> 35 (283)	133 (46.9)		
Marital status:			
Unmarried (142)	22 (15.4)	3.89 (2.37-6.48)*	2.92 (1.64 -5.19)*
Married (403)	168 (41.6)		
Having children: (n=413)			
No (97)	31 (31.9)	1.69 (1.04-2.74)*	-
Yes (316)	140 (44.3)		
Occupational differentials:			
Work load (history)			
Less (282)	66 (23.4)	2.92 (2.02-4.21)*	0.93 (0.45-1.92)
More (263)	124 (47.1)		
NCD Risk factor			
Blood sugar level (mg/dl) (n=534)			
<140 (455)	146 (32.0)	2.58(1.55-4.10)*	1.78(0.98-3.26)
≥ 140 (79)	43 (54.4)		
Blood pressure			
Non HTN (434)	109 (25.1)	2.58 (1.55-4.10)*	1.78 (0.98 -3.26)
HTN (111)	81 (72.9)		
DASS 21:			
Depression			
Absent (330)	120 (36.3)	8.05 (5.02-12.90)*	5.61 (3.24-9.72)*
Present (215)	70 (32.5)		
Anxiety			
Absent (129)	41 (31.7)	0.84 (0.58 -1.21)	-
Present (416)	149 (35.8)		
Stress			
Absent (363)	101 (27.8)	1.19 (0.78 1.82)	-
Present (182)	89 (48.9)		
Physical exercise			
Yes (175)	68(38.8)	2.48 (1.71-3.59)*	1.19 (0.72-1.95)*
No (370)	122 (32..9)		

*Significant at 95% confidence interval

Table 4: Univariate & multivariable logistic regression analysis for effect of factors on hypertension of the study subjects (n-545)

Variables	Presence of hypertension		
	Number (%)	OR (95 % CI)	AOR (95 % CI)
Socio-demographic:			
Age (in years)			
≤ 35 (262)	17 (6.4)	7.16 (4.13-12.42)*	6.40 (3.41- 12.01)*
> 35 (283)	94 (33.2)		

Marital status:				
Unmarried (142)	16 (11.2)			-
Married (403)	95 (23.5)	2.42 (1.37-4.29)*		
Occupational differentials:				
Work load (current)				
Less (382)	74(19.3)			
More (163)	37 (22.6)	1.22(0.78-1.90)		-
Work load (history)				
Less (282)	21 (7.4)			
More (263)	90 (34.2)	6.46 (3.87-10.79)*		-
NCD Risk factor				
Blood sugar level (mg/dl) (n=534)				
<140 (455)	78(17.1)			
≥ 140 (79)	32 (40.5)	3.29 (1.97-5.48)*		
BMI				
Normal (355)	30 (8.4)			
Overweight (190)	81(42.6)	8.05 (5.02-12.90)*	5.82 (3.39 – 9.96)*	
Wrist circumference				
≤ 88 cm (455)	65(14.2)			
> 88 cm (90)	46(51.1)	6.27 (3.84-10.23)*		-
DASS 21:				
Depression				
Absent (330)	64 (19.3)			
Present (215)	47 (21.8)	1.16 (0.76-1.77)		-
Anxiety				
Absent (129)	10 (7.7)			
Present (416)	101(24.2)	3.81 (1.92-7.55)*		-
Stress				
Absent (363)	33 (9.0)			
Present (182)	78 (42.8)	7.50 (4.72-1.91)*	7.55 (4.40 – 12.95)*	

*Significant at 95% confidence interval

Table 5: Univariate & multivariable logistic regression analysis for effect of factors on postprandial blood sugar level (> 140 mg/dl) of the study subjects (n-534)

Variables	Presence of postprandial blood sugar level (≥ 140 mg/dl)		
	Number (%)	OR (95 % CI)	AOR (95 % CI)
Socio-demographic:			
Age (in years)			
≤ 35 (255)	28 (10.9)		
> 35 (279)	51 (18.2)	1.81 (1.10-2.97)*	0.57 (0.18-1.82)
Marital status:			
Unmarried (138)	20 (14.4)		
Married (396)	59 (14.8)	1.03 (0.59-1.78)	-
Occupational differentials:			
Work load (current)			
Less (372)	60 (16.1)		
More (162)	19 (11.7)	0.69 (0.39-1.20)	-
Work load (history)			
Less (274)	27 (9.8)		
More (260)	52 (20.0)	2.28 (1.38-3.77)*	2.83 (0.90-8.87)
NCD Risk factor			
Blood pressure			
Non hypertension (424)			
Hypertension (110)	47 (11.0)		
BMI	32 (29.0)	3.29 (1.97-5.48)*	0.97 (0.50-1.86)
Normal (345)			
Overweight (189)	36 (10.4)		
Wrist circumference	43(22.7)	2.52 (1.55-4.10)*	1.60 (0.90-2.84)
≤ 88 cm (445)	59 (13.2)		
> 88 cm (89)	20 (22.4)	1.89 (1.07-3.34)*	-
DASS 21:			
Depression			
Absent (323)	42 (13.0)	1.42 (0.88-2.30)	
Present (211)	37 (17.5)		
Anxiety			-

Absent (125)	14 (11.2)	1.49 (0.80-2.77)	
Present (409)	65(15.8)		
Stress			-
Absent (356)	17 (4.7)		
Present (178)	62 (34.8)	10.65 (5.98-18.97)*	9.40 (5.09 -17.36)*

*Significant at 95% confidence interval

Discussion

In present study mean age of the participants was 37.5 years (10.4) with minimum age 23 years and maximum 59 years and more than half (51.9%) of the participants were thirty five years or below. In a study conducted by Hilleshein and Lantert at a university hospital in Brazil the average age of nurses was 42.6 years. In present study prevalence of NCD (one year) among nursing personnel was 35.5%. The morbidities were related to musculoskeletal system (49.4%), non communicable disease (23.2%). One study by Derek in Chinese hospital, among 282 female, registered nurses showed that the 12 month period-prevalence of musculoskeletal complaints was 70%. The lower back was the most commonly reported body site (56%), followed by the neck (45%), shoulder (40%) and upper back (37%). Over weight and obesity was a risk factor for low back pain. A cross-sectional study conducted by Vasconcelos [14]in Rio Branco/State of Acre, Brazil, involving 272 participants with a questionnaire including socio demographic characteristics, working conditions, lifestyles, work ability, and a fatigue perception scale found that a total of 85.7% of the participants reported one or more diseases in the past 12 months. Most prevalent diseases were: musculoskeletal diseases (37.1%), digestive diseases (28.7%), mental disorders (28.3%), work injuries (27.9%), and respiratory diseases (26.8%). In current study mean body mass index of the respondents was 23.8(3.1). More than half of our study participants (62.3%) had normal BMI while one third (33.0 %) were overweight and only 1.8% were obese. In previous study by Miller, mean body mass index (BMI) of nurses surveyed was 27.2 with 54% of overweight or obese. More than one third (38.5%) of the study subjects had normal blood pressure; 41.1% were pre hypertensive; 18.7% & 1.7% were stage 1 & 2 hypertensive respectively. One cross sectional study with 606 nursing workers by UrbanettoJde [15]examined risk factors related to the workplace environment to identify positive associations with hypertension disorders and reported that the prevalence of hypertension was 32% in contrast to present study where prevalence of hypertension was 20.4%.Majority of the study subjects (85.3%) had normal PP blood sugar level i.e.<140 mg/dl followed by 14.0% of sugar level between (140-199) mg/dl and only four participants were newly diagnosed diabetic as their PP blood sugar level was 200 mg/dl.

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