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Characterization of Health Status and Modifiable Behavioral Risk Factors Among Workers in a Rural Teaching and Research Hospital: A Preliminary Analysis

Harrison Ndetan, MPH, MD, PhD, Kirk Calhoun, MD, FACP, Jeffrey Levin, MD, MPH, DrPH and Christie C. Osuagwu, PhD, MPA, MSN, FNP*

The University of Texas Health Science Center at Tyler, Texas, USA.

***Correspondence:**

Christie C. Osuagwu, PhD, MPA, MSN, FNP, The University of Texas Health Science Center at Tyler, 11937, U.S Hwy, 271, Tyler, Texas 75708, USA.

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ABSTRACT

Purpose: To conduct a preliminary assessment of the health status and modifiable behavioral risk factors of employees in a teaching and research hospital in rural Northeast Texas with the goal of implementing a focused wellness program to enhance employees' wellness.

Methods: A self-administered 20-item health status survey was conducted among workers of a teaching/research hospital in rural Northeast Texas. The survey included questions on the perceived general health status, history of specific health issues, work-related factors and modifiable health behavioral factors. Potential association between self-perceived general health status and assessed factors were performed using binary logistic regression reporting crude odds ratios (OR) and associated 95% confidence intervals (CI).

Results: Of the 340 (23.7%) employees who completed the survey, 88.5% reported good/excellent health. Over 72% self-identified as overweight/obese, 33.5% high stress, 32.1% high blood pressure, 26.5% high cholesterol. Good/excellent health was more likely to be associated with age (OR=1.03, 95% CI=1.00-1.06), college education (OR=2.48, 95% CI=1.10- 5.57), earning over 50K (OR=3.91, 95% CI=1.67-9.19), engaged in frequent exercise (OR=5.06, 95% CI=2.16-11.86), having a primary care physician (OR=2.32, 95% CI=1.05-5.12), previous participation in a weight management program (OR=2.22, 95% CI=1.13-4.35), and less likely with working as researcher (OR=0.22, 95% CI=0.08-0.59), academic faculty (OR=0.20, 95% CI=0.05-0.89), and nurse assistants (OR=0.21, 95% CI=0.06-0.75), consuming fat/high carb diets (OR=0.46, 95% CI=0.22-0.95), and fruit juice (OR=0.44, 95% CI=0.21-0.89).

Conclusion: This survey identified some preliminary behavioral and work-related factors specific to this rural teaching/research hospital based upon which an employees' wellness program is recommended for implementation. This includes nutrition, physical activity and weight management interventions.

Keywords

Employee health, Healthcare institution, Rural health.

Introduction

Employee wellness has emerged as a very important issue in the broader debate on health promotion and primary prevention. The public health community including employers and employees has

long touted the benefits of a comprehensive wellness program to ensure a healthy workforce and has also contemplated whether or not it makes good business sense [1]. Nonetheless, many businesses are beginning to embrace the concept and a wide variety of health promotion and wellness programs have been developed and implemented [2,3]. Many of these programs are tailored to the specific needs of the targeted workforce. The healthcare industry,

one of the late adopters of this concept, has a workforce that is unique in its occupational exposures. Some authors have branded hospital workers as “less healthy than the general workforce”, incurring more healthcare costs than employees in other professions [4]. Work-related stress and burnout have been examined as key occupational health issues among these workers especially their impact on work structure and environment [5-9]. The challenge of night shift work has always been a topic of concern for nurses, especially with the major issue of distorted circadian rhythm which may lead to chronic exhaustion and burnout [10]. A number of studies have documented some associations of night shift work with many health problems including obesity, diabetes, and various forms of cancer (cancer of the lungs, colon/rectum, breast and prostate) among nurses [11-20]. Burnout has also been noted as a major factor among physicians and some recommendations for solutions have been proposed [21-24].

The population dynamics and health status of the various regions across the United States (US) vary. For example, according to America’s Health Rankings, when assessing the overall health status in the US, Texas ranks 34th, with a rank of 43/50 in obesity, 34/50 in physical inactivity, and preventable hospitalizations [25]. Rural settings in particular tend to have even worse outcomes. Northeast (NE) Texas, a primarily rural region, has a higher overall age-adjusted mortality rate than the rest of the state of Texas, due to several chronic diseases. Crude mortality rates are also above the Texas average, as well as the US national average, according to the 2018 County Health Rankings [26]. If the healthcare workforce in rural NE Texas has similar health-related characteristics of the general population of this region, then health promotion interventions to enhance the employees’ health and wellness may be warranted. However, as previously alluded, to ensure success of such interventions, they need to be tailored to the specific needs of the target population. A recent cross-sectional study that looked at healthcare workers in six Texas hospitals noted high rates of obesity with high positive associations with high blood pressure and diabetes [27]. Another study noted that healthcare workers were more apt to adopt healthy nutrition and exercise, as well as take more responsibility for their health than employees of other professions, but not as good in spiritual growth, interpersonal relations, and stress management [28].

While such information involving healthcare workers is available for the entire State of Texas, there is a relative dearth in literature concerning the healthcare workforce of rural NE Texas. Thus, this study was designed to conduct a preliminary assessment of the health status and modifiable behavioral risk factors of the employees in a teaching and research hospital in rural Northeast Texas, with the goal of implementing a focused health promotion and wellness program, based on the findings to enhance employees’ wellness.

Materials/Methods

Following approvals by the leadership of the institution to implement an employee wellness program and by the Institutional Review Board (IRB) to conduct a preliminary assessment of the employees’ health status, a self-administered 20-item health status

survey was conducted among workers of a teaching (graduate medical, biomedical technology and public health education) and research hospital in rural NE Texas. The survey was completed confidentially and utilized an on-line survey tool to reach participants. All 1,432 employees of the institution were invited to participate. The survey was posted for a period of two weeks between the last week of November and the first week of December 2016. The survey included questions on the perceived general health status, previous history of specific health issues (such as stress level, hypertension, high cholesterol, diabetes, sleep apnea, hypothyroidism, cancer, access to care and weight management), work-related factors (such as job types, shift, and stress levels), modifiable health behavioral factors (such as hours of sleep per day, eating pattern/habit, amount/type of fluid intake per day, exercise habit type and frequency) and typical demographics (gender, race/ethnicity, age, education and income).

Respondents were also asked to report their height (in inches/feet), weight (in pounds) as well as their perceived body weight category as either underweight, normal weight, overweight, or obese. Body mass index, (in Kg/m²) was computed from self-reported height and weight and was further categorized into the standard body weight categories: underweight (BMI<19.5), normal weight (19.5- <25), overweight (25- <30), obese (30 - <35) and morbidly obese (>=35).

Perceived general health was captured as excellent, good, fair or poor. For the purpose of this analysis it was further dichotomized into “Excellent/Good” and “Fair/Poor”.

Data analysis

Data collected via the online questionnaire was imported into the Statistical Analysis System, version 9.4 (SAS Institute, Cary, NC, USA) software for data management and analyses. Descriptive data analyses generated basic summary measures of all survey responses.

Individual assessments of potential association between self-perceived general health status and each of the socio-demographics, work-related, and modifiable behavioral factors were performed using binary logistic regression reporting crude odds ratios (OR) and associated 95% confidence intervals (CI). Adjusted odds ratios (AOR) and corresponding 95% CIs were generated from multiple logistic regression models to explore the potential predictors of perceived general health.

Results

Of the 1,432 employees who were invited to participate, only 340 (23.7%) responded to the survey. These comprised 273 (80.3%) females, 242 (71.2%) Non-Hispanic Whites, 48 (14.1%) Blacks, 25 (7.4%) Hispanics, and 21 (6.2%) Asians. The mean age (standard deviation) was 45.5 (12.2) years. There was a fair distribution of academic attainment with a much larger percentage (83.3%) having had college education, and 19.1% with graduate/professional degrees. Income distribution was also fair with about a third of the participants in each of the various income categories captured (income<=50K, 50K<income<=100K and Income>100K).

Work-related Characteristics

Apart from the above socio-demographics, table 1 also depicts the distribution of the survey respondents based on specific work-related characteristics. A vast majority were clinical staff, mostly nursing staff, including nurse assistant (n=107, 31.5%) and other support staff (n=96, 28.2%). Only 8 (2.4%) were purely academic faculty, 17 (5.0%) physicians and 21 (6.2%) were dedicated researchers. Over 90% of the respondents reported working a day shift and 8.8% a night shift.

Table 1: General distribution of socio-demographic and work-related characteristics, modifiable health behavioral risk factors, and related health conditions among workers in a rural teaching and research hospital in Northeast Texas (n=340).

Factors		n (%)	
Socio demographic factors	Gender	Female	273 (80.3)
		Male	67 (19.7)
	Race/ethnicity	White	242 (71.2)
		Blacks	48 (14.1)
		Hispanics	25 (7.4)
		Asian	21 (6.2)
		Others	4 (1.2)
	Age	Mean (standard deviation)	45.5 (12.2)
	Education	Less than high school	37 (10.9)
		High school diploma/GED	20 (5.9)
		Some college	68 (20.0)
		Associate degree	66 (19.5)
		Bachelor's degree	82 (24.1)
	Household income per year	Graduate/Professional degree	67 (19.7)
		0-50K	106 (31.2)
		>10 – 100K	121 (35.6)
	Self-perceived body weight	>100K	113 (33.2)
		Underweight	7 (2.1)
		Normal weight	86 (25.3)
	Computed BMI	Overweight	177 (52.1)
Obese		70 (20.6)	
Underweight		4 (1.2)	
Normal weight		71 (21.1)	
Overweight		95 (28.2)	
Work-related Characteristics	Job type	Obese	67 (19.9)
		Morbid Obese	100 (29.7)
		Administration	16 (4.7)
		Faculty - Academics	8 (2.4)
		Physician	17 (5.0)
		Researcher	21 (6.2)
		Nurse practitioner	8 (2.4)
		Registered nurse including LVN	88 (25.9)
		Management	41 (12.1)
		Lab tech	15 (4.4)
	Administrative Assistant	45 (13.2)	
	Work Shift	CNA	11 (3.2)
		Day	308 (90.6)
Work-related Characteristics	Work Shift	Evening	7 (2.1)
		Night	25 (7.4)
Modifiable health behavior	Stress level	Low	30 (8.8)
		Medium	196 (57.7)
		High	114 (33.5)
	Hours of sleep per day	2-4	7 (2.1)
>4-6		97 (28.5)	
>6		236 (69.4)	
Eating Habit	Regular breakfast	173 (50.9)	
	Balanced meals	104 (30.6)	
	Snack between meals	240 (70.6)	
	5-9 servings of fruits/vegetable	46 (13.5)	
	Fat/high carb diet	190 (55.9)	
Water consume per day	<= 16 ounces	61 (17.9)	
	17-32 ounces	98 (28.8)	
	33-48 ounces	100 (29.4)	
	49-64 ounces	48 (14.1)	
	>64 ounces	33 (9.7)	
Other drinking habit	Fruit juice	73 (21.5)	
	Beverages (Soda)?	153 (45.0)	
Quantity of beverages consumed per day	Beer	0 (0.0)	
	<= 16 ounces	133 (53.0)	
	17-32 ounces	74 (29.5)	
	33-48 ounces	31 (12.4)	
	49-64 ounces	10 (4.0)	
Exercise habit	>64 ounces	3 (1.2)	
	Walk	216 (63.5)	
	Jog	25 (7.4)	
	Run	12 (3.5)	
Exercise frequency	Strength	56 (16.5)	
	Daily	62 (18.7)	
	One to many times a week	202 (60.8)	
Health conditions	Self-perception of general health	Never	68 (20.5)
		Excellent	119 (35.0)
		Good	182 (53.5)
	Specific Health Issues	Fair	32 (9.4)
		Bad	7 (2.1)
		High Stress	114 (33.5)
		High Blood Pressure	109 (32.1)
		Diabetes	38 (11.2)
		Sleep apnea	52 (15.3)
	Types of Cancer	High Cholesterol	90 (26.5)
Hypothyroidism		48 (14.1)	
Cancers		12 (3.5)	
Access to Health care	Colon	1 (0.3)	
	Breast	3 (0.9)	
Weight Management	Others	9 (2.7)	
	Have Primary care physician	291 (85.6)	
Successful weight management	Tried weight management program	207 (60.9)	
	Tried Bariatric surgery	25 (7.4)	
		134 (50.6)	

Modifiable Behavioral Risk Factors

About 66% of the survey respondents noted that they typically have more than 6 hours of sleep each day. Reported dietary practices revealed that over 50.9% eat breakfast, with most (70.6%) snacking between meals, but only 30.6% eat balanced meals with about 55.9% consuming high fat meals, and only 13.5% taking 5-9 servings of fruits and vegetables per day. A substantial proportion (45%) consume soda beverages, with over 75% consuming less than the recommended daily water intake of 64 ounces/day.

Analysis of the exercise habits of the respondents revealed that 63.5% reported walking and 16.5% engaging in strengthening exercises with a general frequency of one to many times a week. However, 20.5% noted that they do not engage in any kind of exercise activity.

Perceived General Health and Specific Health-related Issues

Most (n=301, 88.5%) of the respondents of this survey perceived their general health as good or excellent. However, over 72% self-identified as overweight or obese with a mean computed body mass index (BMI in Kg/m²) of 31.4. Weight assessment from computed BMI is indicative of a potential weight problem in close to 78% including 67 (19.9%) obese (30<=BMI<40) and 100 (29.7%) morbidly obese (BMI>=40). Many (n=207, 60.9%) had previously participated in a weight management program including having bariatric surgery (7.4%) with 134 (50.6%) noting some form of success.

Other health-related issues among this cohort include high stress levels (32.1%), high blood pressure (32.1%), diabetes (11.2%), sleep apnea (15.3%), high cholesterol (26.5%), hypothyroidism (14.1%), and cancers (3.5%) with some indicating multiple health issues. Many (n=291, 85.6%) reported they were under the care of a primary care physician.

Table 2 shows a distribution of the perceived general health status of the survey participants according to socio-demographics, work-related, modifiable risk behavior and health-related issues. According to the table, there seemed to be a racial difference in the perception of general health as all the non-Hispanic Whites and Blacks and none of the Hispanics and Asians noted their general health as good or excellent. A 3% increase in odds was noted for every year increase in age on how likely the respondents were to perceive their general health as good/excellent (OR=1.03, 95% CI=1.00-1.06). Those with some college education/college degrees were more likely to perceive their general health as being good or excellent compared to those with less than college education (OR=2.48, 95% CI=1.10- 5.57) as well as those making over 50K compared to those earning less than or equal to 50K (OR=3.91, 95% CI=1.67-9.19, for 50K<income<=100K and OR=3.64, 95% CI=1.55-8.55, for income >100K).

Table 2: Association between perceived general health status and work-related factors, modifiable risk behavior and health-related issues among workers in a rural teaching and research hospital (n=340).

Factors		Excellent/ Good n (%)	Fair/Poor n (%)	OR (95%CI)
Socio demographic factors				
Gender	Female	244 (89.4)	29 (10.6)	0.68 (0.31,1.47)
	Male	57 (85.1)	10 (14.9)	Ref
Race/ethnicity	White	119 (100.0)	0 (0.0)	Ref.
	Blacks	182 (100.0)	0 (0.0)	0.23 (0.10,0.56)*
	Hispanics	0 (0.0)	32 (100.0)	0.25 (0.08,0.75)*
	Asian/Others	0 (0.0)	7 (100.0)	0.09 (0.04,0.24)*
Age	Mean (standard deviation)	30.8 (8.0)	41.9 (12.6)	1.03 (1.00,1.06)*
Education	Less than college	46 (80.7)	44 (19.3)	Ref.
	Some college/ degree	197 (91.2)	19 (8.8)	2.48 (1.10,5.57)*
	Graduate/ Professional degree	58 (86.6)	9 (13.4)	1.54 (0.59,4.03)
Household income per year	0-10K	83 (78.3)	23 (21.7)	Ref.
	>10 – 100K	113 (93.4)	8 (6.6)	3.91 (1.67,9.19)*
	>100K	105 (92.9)	8 (7.1)	3.64 (1.55,8.55)*
Work-related Characteristics				
Researcher	Yes	14 (66.67)	7 (33.3)	0.22 (0.08,0.59)*
	No	287 (90.0)	32 (10.0)	Ref
Physician	Yes	17 (100.0)	0 (0.0)	?
	No	284 (87.9)	39 (12.1)	Ref
Faculty- Academic Administration	Yes	5 (62.5)	3 (37.5)	0.20 (0.05,0.89)*
	No	296 (89.2)	36 (10.8)	Ref.
	Yes	15 (93.8)	1 (6.3)	2.00 (0.26,15.52)
	No	286 (88.3)	0 (0.0)	Ref.
Nurse practitioner	Yes	8 (100.0)	39 (11.8)	?
	No	293 (88.3)	167 (50.8)	Ref.
Registered nurse including LVN	Yes	83 (94.3)	5 (5.7)	2.59 (0.98,6.84)
	No	218 (86.5)	34 (13.5)	Ref.
Management	Yes	39 (95.1)	2 (4.9)	2.75 (0.64,11.88)
	No	262 (87.6)	37 (12.4)	Ref.
Lab tech	Yes	12 (80.0)	3 (20.0)	0.49 (0.13,1.85)
	No	289 (88.9)	36 (11.1)	Ref.
Administrative Assistant	Yes	39 (88.7)	6 (13.3)	0.82 (0.32,2.08)
	No	262 (88.8)	338 (11.2)	Ref.
CNA	Yes	7 (63.6)	4 (36.4)	0.21 (0.06,0.75)*
	No	294 (89.4)	35 (10.6)	Ref.
Other support staff	Yes	82 (85.4)	14 (14.6)	0.67 (0.33,1.35)
	No	219 (89.8)	25 (10.3)	Ref.
Work Shift	Day	276 (89.6)	32 (10.4)	Ref.
	Evening	5 (71.4)	2 (28.6)	0.29 (0.05,1.56)
	Night	20 (80.0)	5 (20.0)	0.46 (0.16,1.32)
Stress level	Stressed	276 (89.0)	34 (11.0)	1.62 (0.58,4.52)
	Not stress	25 (83.3)	5 (16.7)	Ref.

Modifiable risk behavior				
Hours of sleep per day	< 6	88 (84.6)	16 (15.4)	Ref
	>=6	213 (90.3)	23 (9.8)	1.68 (0.85,3.39)
Eating Habit				
Regular breakfast	Yes	155 (89.6)	18 (10.4)	1.24 (0.64,2.42)
	No	146 (87.4)	21 (12.6)	Ref.
Balanced meals	Yes	94 (90.4)	10 (9.6)	1.32 (0.62,2.81)
	No	207 (87.7)	29 (12.3)	Ref.
Snack between meals	Yes	216 (90.0)	24 (10.0)	1.59 (0.79,3.17)
	No	85 (85.0)	15 (15.0)	Ref.
5-9 servings of fruits/vegetable	Yes	42 (91.3)	4 (8.7)	1.42 (0.48,4.20)
	No	259 (88.1)	35 (11.91)	Ref.
Fat/high carb diet	Yes	162 (85.2)	28 (14.7)	0.46 (0.22,0.95)*
	No	139 (92.7)	11 (7.3)	Ref.
Water consume per day	<= 16 ounces	50 (82.0)	11 (18.0)	Ref.
	17-32 ounces	85 (86.7)	13 (13.3)	1.44 (0.60,3.45)
	33-48 ounces	92 (92.0)	8 (8.0)	2.53 (0.96,6.70)
	49-64 ounces	44 (91.7)	4 (8.3)	2.42 (0.72,8.15)
	>64 ounces	30 (90.9)	3 (9.1)	2.20 (0.57,8.52)
Fruit juice	Yes	59 (80.82)	14 (19.2)	0.44 (0.21,0.89)*
	No	242 (90.6)	25 (9.4)	Ref.
Soda	Yes	132 (86.3)	21 (13.7)	0.67 (0.34,1.31)
	No	169 (90.4)	18 (9.6)	Ref.
Exercise habit				
Walk	Yes	195 (90.3)	21 (9.7)	1.58 (0.80,3.09)
	No	106 (85.5)	18 (14.5)	Ref
Jog	Yes	23 (92.0)	2 (8.0)	1.53 (0.35,6.76)
	No	278 (88.3)	37 (11.8)	Ref.
Run	Yes	10 (83.3)	2 (16.7)	0.64 (0.13,3.01)
	No	291 (88.7)	37 (11.31)	Ref.
Strength	Yes	53 (94.6)	3 (5.4)	2.56 (0.76,8.64)
	No	248 (87.3)	36 (12.7)	Ref.
Exercise frequency	Daily	48 (77.4)	14 (22.6)	Ref.
	Two-4 times a week	191 (94.6)	11 (5.5)	5.06 (2.16,11.86)
	Never	56 (82.4)	12 (17.7)	1.36 (0.58,3.22)
Health conditions				
Self-perceived Obesity	Obese	69 (41.3)	1 (0.6)	1.87 (0.70,4.98)*
	Not obese	98 (58.7)	169 (99.4)	Ref
Computed obesity	Obese	147 (88.0)	20 (12.0)	0.87 (0.44,1.71)
	Not obese	152 (89.4)	18 (10.6)	Ref
High blood pressure	Yes	94 (86.2)	15 (13.8)	0.73 (0.36,1.45)
	No	207 (89.6)	24 (10.4)	Ref.
Diabetes	Yes	33 (86.8)	5 (13.2)	0.84 (0.31,2.29)
	No	268 (88.7)	34 (11.3)	Ref.
Sleep apnea	Yes	48 (92.3)	4 (7.7)	1.66 (0.56,4.89)
	No	253 (87.9)	35 (12.2)	Ref.
High cholesterol	Yes	82 (91.1)	8 (8.9)	1.45 (0.64,3.29)
	No	219 (87.6)	31 (12.4)	Ref.

Hypothyroidism	Yes	45 (93.8)	3 (6.3)	2.20 (1.15,4.19)
	No	256 (87.7)	36 (12.3)	Ref.
Cancers	Yes	12 (100.0)	0 (0.0)	?
	No	289 (88.1)	39 (11.9)	Ref.
Have Primary care physician	Yes	262 (90.0)	29 (10.0)	2.32 (1.05,5.12)*
	No	39 (79.6)	10 (20.4)	Ref.
Tried weight management Program	Yes	190 (91.8)	17 (8.2)	2.22 (1.13,4.35)*
	No	111 (83.5)	22 (16.5)	Ref.
Tried bariatric surgery	Yes	20 (80.0)	5 (20.0)	0.48 (0.17,1.37)
	No	281 (89.2)	34 (10.8)	Ref.
Successful weight management	Yes	121 (90.3)	13 (9.7)	1.48 (0.69,3.16)
	No	113 (86.3)	18 (13.7)	Ref.

Researchers (OR=0.22, 95% CI=0.08-0.59), academic faculty (OR=0.20, 95% CI=0.05-0.89), and nurse assistants (OR=0.21, 95% CI=0.06-0.75) were less likely to perceive good/excellent health compared to their counterparts not doing similar jobs as well as those consuming fat/high carb diets (OR=0.46, 95% CI=0.22-0.95), and fruit juice (OR=0.44, 95% CI=0.21-0.89). On the other hand, those who engaged in frequent exercise of at least a few times a week (OR=5.06, 95% CI=2.16-11.86), have a primary care physician (OR=2.32, 95% CI=1.05-5.12) and had previously participated in a weight management program (OR=2.22, 95% CI=1.13-4.35), noted increased odds of perceiving their general health as good/excellent as compared to those who did not portray these features. The above effect measures were crude but statistically significant.

After adjusting for the above factors having statistically significant associations with perceived general health, a reduced odds to perceive good/excellent general health was observed in researchers (AOR=0.19, 95% CI=0.04-0.96) and income of <50K compared to those >100K (AOR=0.49, 95% CI=0.25-0.97) and increased odds among those who had previously participated in a weight management program (AOR=3.93, 95% CI=2.31-6.70).

Substantially increased, but non-statistically significant likelihoods (OR>2.0) of reporting perceived general health as good/excellent were also noted among males, nursing and management staff, daily consumption of recommended quantity of water and engaging in strengthening exercise.

Discussion

This study was focused on a specific healthcare organization in a rural NE Texas region, but findings from the study mirror findings from many previous studies focused on healthcare workers [4,5,29]. Although previous studies on healthcare workers focused heavily on night shift workers [11-15], most of the participants in our study were day shift workers and less than ten percent worked at night, yet the results were similar. However, most respondents in this study noted high/medium stress which is understandable given that day shift workers deal with most serious active work on patients during the day. They reported getting 6-8 hours of

sleep per night, which is considered reasonable and in line with generally recommended sleep hours per night. This may mean that healthcare workers deal with higher stress during the day shift, but they may balance their stress with reasonable hours of sleep at night which may be providing some level of protection/buffer. It could be surmised that the stress for night shift workers may be related more to lack of sleep and not necessarily the intensity of work. Findings from previous studies in this regard have been mixed [7-10].

This study also revealed the fact that healthcare workers like the general public deal with different health problems, including obesity, hypertension, diabetes and cancers. Although the population included fifty percent of educated individuals who have college/professional degrees or higher, that did not translate to nutrition knowledge or healthier lifestyle behaviors. Obviously, the study showed that even though the population is primarily healthcare workers, their knowledge, lifestyle, and health behaviors mirrored that of the general public. It should be noted that, while this study targeted a healthcare environment, many support staff who may not necessarily have the expected knowledge level comprise a significant portion of the population.

Household income also showed a picture that is not necessarily favorable to those whose incomes are in the low category which undeniably poses a challenge for these individuals, although the issue could be a combination of lack of money and lack of knowledge. All these add some level of complexity, but with or without high household income, education is critical both for the highly educated and high income, as well as the not so educated with low income. It is not safe to assume that all healthcare workers, even physicians know all the answers or all the solutions as some with high income/education may be dealing with some other issues like high stress which may prevent them from adopting healthy lifestyles of daily exercise, fruit and vegetable consumption and relaxed eating. The work-related high and medium level of stress noted in this study could be moderated by more hours of sleep. However, that may not necessarily be enough given the stress level related to working in a healthcare environment. Healthcare workers may unconsciously absorb some of the physical and emotional stress from very sick patients and their families. This is an area that deserves further studies. Overall, our study confirms/reveals that working in the healthcare environment or being a healthcare professional does not impart instant “immunity” against routine common health problems. In fact, given the stress level, and the occupational challenges, healthcare workers are really at greater risk for major health challenges and patients may be unconsciously exposed to high risks related to medical errors [30]. Accordingly, several observations and recommendations for appropriate interventions have been suggested by different authors [29,31]. The onus is on healthcare organizations to engage in serious self-assessment and consideration for creating/adopting proven wellness programs to enhance the health of their workers.

Limitations

The study utilized a locally designed Likert-scaled survey, but

this tool was reviewed by a group of local experts and determined appropriate to capture vital information from the population of interest covering a broad range of information, including socio-demographic data. A convenience sample of employees from a rural healthcare organization was used, and findings may differ in a non-rural population. There may be other confounding variables that are not necessarily addressed, like years of service in a healthcare environment. Self-reporting of medical illness and a response rate under 25% may represent other limitations.

Conclusions/Implications

This study was designed to conduct a preliminary assessment of the health status and modifiable behavioral risk factors of the employees in a teaching and research hospital in rural Northeast Texas. The study identifies some preliminary behavioral and work-related factors specific to this audience, supporting the need for implementing an employees’ wellness program. These include nutrition, physical activity and weight management interventions. It is apparent from our findings that healthcare workers are not “immune” to unhealthy behaviors, compounded by high stress factors associated with their occupation. Addressing the health and wellness needs of the healthcare workers is very critical so they can more effectively take care of the sick/public who depend on them. Healthcare organizations need to become a major target for wellness program implementation. This will not only improve the health of its employees, but will improve/increase productivity, as well as reduce the burden of health insurance cost for the institutions. Also, healthy and informed healthcare workers are more likely to be better champions for healthy lifestyles both for their patients, their families and the community at large. In general, this study provided answers to the specific questions posed. Committed institutional response and action are encouraged in healthcare organizations to ensure a healthier and more productive workforce.

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