

A CORRELATIONAL STUDY ON BLOOD PRESSURE, STRESS AND BODY MASS INDEX (BMI) AMONG BSC NURSING STUDENTS IN A SELECTED COLLEGE OF NURSING UDUPI DISTRICT

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Abstract :

Increasing trend of hypertension and overweight have become a global health problem among youngsters. Over weight is strongly related to high blood pressure and the consequences of the increasing prevalence of overweight will be enormous in the future. Students in nursing profession are adolescents and they may have adjustment problems with new surroundings such as hostel, hospital and new curriculum. The stress experienced may predispose them to have increased blood pressure. A Cross sectional, correlational survey was conducted on blood pressure, stress and body mass index (BMI) among 200 BSc. Nursing Students in a selected college of nursing in Udupi District. The objectives of the study were to determine the blood pressure (BP), body mass index (BMI) and stress level of BSc nursing students, to compare the BP, BMI and stress of various batches of BSc nursing students and to determine the relationship among Blood pressure, BMI and stress. It is observed that 45% of the subjects were in pre hypertensive stage, and 3% in hypertension stage. Majority of the subjects had normal BMI. Moderate stress was experienced by 95.5% of the subjects. Study found a weak but positive correlation between BMI and BP and negative correlation with stress. A significant difference was found in mean stress score among four batches of students. There was no significant difference in BMI and BP of four batches of students. As nursing students experience stress, adequate support structures for clinical areas, preceptorship programmes and the availability of student counselling services may be helpful to cope with the stress experienced.

Keywords : young adult, systolic blood pressure (SBP) and diastolic blood pressure (DBP)

Introduction :

Increasing trend of hypertension and overweight have become a global health problems among youngsters. The young adults are in the middle of the most stressful times in life because young adulthood is the time of life when adolescents change into adults. Over weight is strongly related to high blood pressure and the consequences of the increasing prevalence of overweight will be enormous in

the future.¹ Students in nursing profession are adolescents and they may have adjustment problems with new surroundings such as hostel, hospital and new curriculum. The stress

experienced may predispose them to have increased blood pressure. Nursing is recognized as a challenging activity because it requires management of situations involving suffering, pain, death, and also because of the continuity of care and long and often unpredictable work hours that it demands. The growing prevalence of overweight in students and adolescents has become a matter of national concern and is linked to a rise in chronic health conditions in students who previously had low prevalence rates, such as cardiovascular disease. A study examined the relationships between age, ethnicity, race, body mass index (BMI), and elevated blood pressure (BP) in a rural school age population. Data are reported for 1121 students in grades K-11. The sample was 55% African American, 41% Caucasian, 3% Hispanic, and 1% other. The prevalence of students at risk of being overweight (BMI \geq 85th percentile)

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was 46.5%, and the prevalence of overweight students (BMI \geq 95th percentile) was 29.1%. The prevalence of elevated BP was 21.6%. Elevated BMI and BP were more prevalent in older students. While there was a direct relationship between elevated BMI and elevated BP for all groups, African Americans were more likely to have an elevated BP with a normal BMI. These findings demonstrate the important role of the school nurse in providing effective prevention strategies related to screening, follow-up, and treatment.²

This study was conducted to find the relationship between BMI and blood pressure, stress level and blood pressure & stress level and BMI, to compare the blood pressure, BMI and stress of various batches of BSc Nursing students and to find the association between BMI, stress, blood pressure and selected variables such as age, gender, birth order, type of family, religion, frequency of exercise, type of exercise, traumatic experience in childhood and socio economic status. The findings would help the young adults to take a preventive action by early detection and health promotion to attain a standard level of health.

Material and Methods :

A correlational survey was carried out among BSc. Nursing Students of a selected nursing college in Udupi District, Karnataka. A non-probability purposive sampling technique was used for the study.

The tools used for data collection were: Proforma on background information, socio-economic status scale, stress rating scale, Sphygmomanometer and stethoscope, weighing machine and measuring tape. All the questionnaires were developed by the researcher, questionnaires along with objectives, blue print and criteria checklists were given to seven experts from various fields to ensure the content validity. Reliability of the stress rating scale was established by Cronbach's alpha and the alpha value was 0.8. Inter-rater reliability was done for blood pressure value, height and weight of 20 BSc nursing students of a college of nursing by two observers and reliability was found to be 1. Sphygmomanometer, stethoscope, measuring tape and weighing machine were

calibrated and certified Pilot study was conducted among another 20 students who possessed same characteristics of the main study and the study was found to be feasible.

Formal administrative permission for collecting the data was sought from Dean, Manipal College of Nursing, Manipal and an informed consent was taken from the participants. Data were collected from January 24th to February 23rd 2009 by administering questionnaires on back ground information, socio economic status, and stress and by checking BP, height and weight of 200 samples of BSc nursing students.

Result :

Description of sample characteristics

With regard to sample characteristics out of 200 subjects 134(67%) belonged to the age group of 17- 20 years and 154(77%) were females and 46(23%) were males. Data on birth order showed that 115 (57.5%) of the samples were first born. Regarding type of family 175(87.5%) belonged to nuclear family. Majority ie., 163 (81.5%) of the subjects were Christians and 81 (40.5%) were not doing any exercises, 59(24.5%) were doing exercise once in a week and 68(34%) of them were going for walk. Majority ie, 161(80.5%) did not experience any trauma during childhood, whereas 39(19.5%) of them experienced trauma either from parents, accidents, calamities or teachers. Data on socio economic status showed that 112(56%) were from middle class.

The data describing year wise sample characteristics of blood pressure, body mass index and stress revealed that among first years 46 (92%) are in normal range of blood pressure. But among second, third and forth year students, the percentage of blood pressure in normal category were 42(84%), 42(84%) and 40(80 %) respectively. With regard to body mass index only 1(2%) have overweight among first year students whereas in second and third years 3(6%) and 7(14%) were in the category of overweight. Stress show that out of 200 samples, 7(3.5%) were experiencing mild stress, 191(95.5%) were having moderate stress and 2(1%) of the samples were in severe stress.

Description of the blood pressure level of the subjects

Among 200 subjects, 130(65%) have SBP >120, 69(34.5%) showing the blood pressure in the range of 120-139mm of Hg and 1(0.5%) was showing SBP \geq 160 mm of Hg and 124(62%) had DBP <80 mm of Hg and, 69(34.5%) and 7(35%) are in the range of 80-89 mm of Hg and 90-99 mm of Hg category respectively. The data related to blood pressure of 200 BSc Nursing students according to Joint National Committee on prevention, detection, evaluation and treatment of high blood pressure (JNC 7) is represented in the table 1.

Description of the body mass index (BMI) of the sample

Among 200 samples, 47(23.5%), 138(69%), 15(7.5%) were in the category of underweight, normal and overweight respectively.

Description of the stress level

It was found that 7(3.5%) were experiencing mild stress, 191(95.5%) were having moderate stress and 2(1%) of the samples were in severe stress category.

Comparison of the blood pressure, BMI and stress level

Normality of the data was checked with Kolmogorov-Smirnov test. As the data were not following the normality, comparison was done with Kruskal-Wallis test and the findings are presented in table 2.

Relationship among BMI, blood pressure and stress

Spearman's rho correlation coefficient was computed as the data were not following the normality. There was significant but weak positive correlation between body mass index and systolic blood pressure ($r=0.295$, $p=0.001$) and diastolic blood pressure ($r=0.33$, $p=0.001$). No significant relationship was found between stress and systolic blood pressure ($r=0.038$, $p=0.594$.) Negative relation was found between stress and diastolic blood pressure but it was not significant. ($r=-0.022$, $p=0.752$). Significant but weak negative relationship was found between body mass index and stress ($r=-0.15$, $p=0.031$).

Association between blood pressure, BMI, stress and selected variables

Mann-Whitney U and Kruskal-Wallis Test was computed to determine the association between blood pressure, BMI, stress and selected variables such as age in years, gender, birth order, type of family, religion, frequency of exercise, type of exercise, traumatic experience in childhood and socio economic status. Findings are presented in tables 3, 4 and 5.

Discussion :

The findings of this study throw light on the importance of health promotion through a blood pressure (BP) screening programme and assessment of stress level and body mass index of the adolescents. This step will lead to planning for effective nursing intervention primarily among nursing field and avoiding complications. Awareness about the interrelation of the variables such as blood pressure, body mass index and stress will improve the knowledge regarding web of causation of the illnesses. Significant but weak negative relationship was found between body mass index and stress ($r=-0.152$, $p=0.031$) stating that as the stress level increases BMI decreases. This is supported by a study conducted to find the relationship between work stress and BMI among 45810 male and female employees of department of Psychology in Finland.³ No significant relationship was found between stress and systolic blood pressure ($r=0.038$, $p=0.594$.) Negative relation was found between stress and diastolic blood pressure ($r=-0.022$, $p=0.752$); but it was not significant.

The limitations identified by the researcher for the present study were; study is done in only one college which limits the generalization of the findings, Blood pressure reading, stress assessment and body mass index calculation were taken only once, Non probability purposive sampling was used to collect the samples and Stress rating scale was developed by the investigator.

Conclusion :

Obesity is less prevalent among students of nursing. The reason could be being in health profession they are aware of the ill effects of being obese. The study revealed that there are cases of prehypertension, hypertension stage 1 and hypertension stage II according to JNC 7 classification.

As nursing students experience some amount of stress interventions may be planned by the administrators.

Acknowledgment :

I tender the most grateful thanks to Dr. Ratna Prakash, Dean Manipal College of Nursing, Manipal University, Manipal for granting permission to conduct the study.

I extend my genuine gratitude to the principals of the colleges where various phases of the study was conducted.

Table 1 : Frequency and percentage distribution of samples based on JNC-7 classification of blood pressure n=200

Classification of blood pressure	Frequency(f)	Percentage (%)
Normal	103	51.5
Pre hypertension	90	45
Hypertension stage one	6	3
Hypertension stage two	1	0.5

Table 2: The mean rank, median, IQR, Kruskal-Wallis 'K' value of blood pressure, BMI, stress level of various batches of BSc. Nursing students n=200

Variables and batches	Mean rank	Median	IQR	P value	K value
SBP					
I year	98.94				
II year	100.6				
III year	103.05	110	20	0.98	0.16
IV year	99.41				
DBP					
I year	91.72				
II year	105.09				
III year	104.5	70	10	0.59	1.94
IV year	100.69				
BMI					
I year	87.5				
II year	105.59				
III year	100.6	20.63	3.91	0.28	3.82
IV year	108.31				
Stress					
I year	114.91				
II year	94.14				
III year	82.45	109	12	0.01*	10.07
IV year	110.5				

* significant $z=1.96(p<0.05)$

Table 3: Association between blood pressure and selected variable

n=200

Selected variables	Test of significance	Blood pressure							
		SBP				DBP			
		Z value	P value	Median	IQR	Z value	P value	Median	IQR
Age	MW test	-1.138	0.255			-1.163	0.245		
Gender	MW test	-2.531	0.011**			-3.185	0.001**		
Birth order	KH test	3.542	0.170			2.085	0.353		
Type of family	KH test	0.722	0.697			2.591	0.274		
Religion	KH test	4.713	0.095			3.473	0.176		
Frequency of exercise	KH test	5.967	0.113	110	20	1.364	0.714	70	10
Type of exercise	KH test	11.196	0.083			13.419	0.037**		
Traumatic	KH test	2.890	0.576			4.093	0.394		
experience in childhood	KH test	0.264	0.876			3.750	0.153		
Socio economic status									

(**significant) $Z=1.96(p<0.05)$

Table 4: Association between BMI and selected variable

n=200

Selected variables	Test of significance	Z value	P value	BMI Median	IQR
Age	MW test	-1.833	0.067		
Gender	MW test	-2.216	0.027**		
Birth order	KH test	1.487	0.475		
Type of family	KH test	2.480	0.289		
Religion	KH test	8.901	0.012**	20.6337	3.9061
Frequency of exercise	KH test	1.631	0.652		
Type of exercise	KH test	15.313	0.018**		
Traumatic experience in childhood	KH test	3.054	0.549		
Socio economic status	KH test	2.748	0.253		

(**significant) Z=1.96(p<0.05)

Table 5: Association between stress and selected variable

n=200

Selected variables	Test of significance	Z value	P value	Stress Median	IQR
Age	MW test	-1.833	0.067		
Gender	MW test	-2.216	0.027**		
Birth order	KH test	1.487	0.475		
Type of family	KH test	2.480	0.289		
Religion	KH test	8.901	0.012**	109	12
Frequency of exercise	KH test	1.631	0.652		
Type of exercise	KH test	15.313	0.018**		
Traumatic experience in childhood	KH test	3.054	0.549		
Socio economic status	KH test	1.915	0.384		

(**significant) Z=1.96(p<0.05)

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