Perceived Stress and its Relation with ABO Blood Groups in Medical and Dental Students

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ABSTRACT

Introduction: Stress refers to emotional strains or tensions on an individual. Medical education can induce significant psychological stress. Remarkable degree of perceived stress has been found among medical and dental students. The aim of present study was to compare stress levels in medical and dentals students with different ABO blood groups.

Method: ABO Blood grouping was done. The Cohen Perceived Stress Scale (CPSS-10), a validated tool, was used to identify levels of stress in young healthy adults. Data collected were analysed using SPSS version 21. Descriptive analysis of levels of perceived stress domains in relation to ABO blood groups was presented as frequency and percentages.

Result: The mean CPSS Score among study population was 26.75±4.86 for medical students and 22.38 ±4.22 for dental students. The total no of students were 310. Out of which male and female population was 170 (54.83%) and 140 (45.16%) respectively. The over all prevalence of stress among students (males and females) was 37.09% with moderate to high degree of stress. Difference between males and females were found remarkable. The females were more stressed as compared to males as per CPSS score. Blood group A had high prevalence of stress of 38.26 % followed by blood group B (24.34 %), AB (20 %) and O (17.39 %) respectively.

Conclusion: The study showed that students with different blood groups have different levels of stress with high prevalence in blood group A.

Keywords: ABO blood groups; CPSS-10; Stress

INTRODUCTION

Stress is an inevitable part of daily life. Hence, an organism will respond with an adaptive set of reactions to adjust with a potentially alarming situation and in the long run to maintain homeostasis.[1] Hans Selye divided stress into three stages and called General Adaptation Syndrome.[2] In early years of medical education, life is very much competitive and demanding, resulting in feelings of distress and worry in many who are unable to cope with the pressures in their surrounding environment.[3,4] 'Stress' is a neuroendocrine, behavioural and immune response of the organism, in response to any derangement that is presented to it (stressor) as a result of the adjustments of threat or danger, enabling the adaptation and survival of the organism.[5] There is an established correlation between ABO blood groups and cancers, peptic ulcer, haemostatic abnormalities and bleeding disorders. Past research has associated ABO blood type and mental stress with increased threat for cardiovascular diseases.[6]

In a study done by Neumann the blood group A had higher initial levels of cortisol and quicker stress recovery rates as compared to blood group O suggesting the ABO blood group as predominant

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factor for stress response and cardiovascular risk. Exposure to the different stress or significantly increases level of cortisol for the group of older adult males. However, the stress response patterns of the ABO blood type A males were different from those of the ABO type O subjects. The blood type A group had higher initial levels of cortisol, as well as faster stress recovery rates than the type O group.[7]

ABO Blood group has been associated with different ailments, however limited literature is available and the correlation of blood group and stress need further research. Still, the very fact that shows affiliation might exist intrigues some researchers, hope someday to uncover the biological processes that associated blood molecules to mental state, presumably up our understanding and management of those ailments. Stressor people with "O" blood group could also be additional seemingly to possess depression and intense anxiety; kids may be at a potential risk of attention-deficit disorder. "A" blood group peoples could be at vulnerable risk to neurotic disorder, sleep disorder and hysteria. Individual with "B" blood group could have a lower risk of attention-deficit disorder. "AB" blood group is vulnerable to loneliness, isolation and emotional stress.[8, 9, 10] Majority of the medical students face a variety of stressors associated with their education; if not immediately identified and adequately managed,[11] it may bring about several negative consequences in terms of psychological wellness and academic performance.[12] The aim of present study was to compare stress levels in medical students with different ABO blood groups.

METHODS

A cross sectional study was conducted during November 2022 and July 2023 after obtaining ethical clearance and approval from the Institutional Review Committee of Kathmandu Medical College (Ref: 9032022/03). The study populations were the first and second year medical and dental students. Purposive sampling method was used. Out of 450 medical and dental students 310 (170 males and 140 females) participated in our study whose age ranged from 17 to 22 years. Among males 170 (MBBS-110 and BDS-60) and females 140 (MBBS-80 and BDS-60). The questionnaire was administered to the students studying in first and second year separately and they were instructed to fill it completely in specific time which was provided to them. The questionnaire consisted of demographic data; universally validated Cohen's Perceived Stress Scale (CPSS-10)[13] with 10 potential stressors which is available free online was used for the study. Individual scores on the CPSS-10 can range from 0 to 40 with higher scores indicating higher perceived stress. Potential stressors were added at the end of questionnaire. Scores ranging from 0-13 was considered as low stress.

1. Scores ranging from 14-26 was considered as moderate stress.
2. Scores ranging from 27-40 was considered as high perceived stress.

Blood grouping of each participant was done by slide method. Commercially prepared antisera A, B and Rh (Biolab Diagnostics India), each was taken and placed on left and right side of a glass slide and for Rh on a separate glass slide as per the protocol. After two minutes both the glass slides were examined for clumping with a naked eye and with microscopes.

The collected data was analysed statistically by SPSS Version 21 and chi-square test was done.

RESULTS

The total sample size of the study was 310 medical and dental students. The age of the studied population ranged from 17 years to 22 years. The mean CPSS Score was 26.75 with standard deviation of 4.86 for medical students and 22.38 with standard deviation of 4.22 for dental students. Table-1 shows the distribution of stress in the study population. The total male and female population (MBBS and BDS) was 170 (54.83%) and 140 (45.16%) respectively. The overall prevalence of stress among students (males and females combined) was found in 37.09% (moderate and high). Among medical and dental students the prevalence of stress (moderate & high) in males was 29.4 % whereas in female students it was 46.42 % (Table1). Difference between males and females was found significant ($P < 0.05$). The females were more stressed. The most potent stressors among the study population

were academic pressures, monetary problems and food. Prevalence of blood groups in study subjects was A (23.22 %), B (32.58%), AB(7.41%) and O(36.77%) respectively (Table 2). Blood group A had high prevalence of stress of 38.26 % followed by blood group B(24.34 %), AB (20 %) and O (17.39 %) respectively (Figure 1).

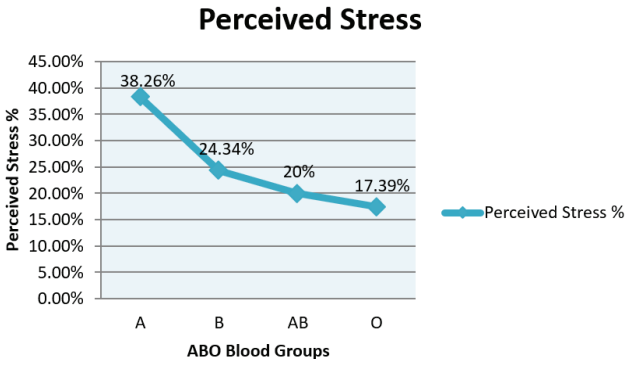
Table 1: Prevalence of Stress (COHEN Perceived Stress Scale-CPSS).

CPSS Grade and Score	Males No. (%)	Females No. (%)	Total
Low Stress 0-13	120 (70.58%)	75 (53.57%)	195 (62.90%)
Moderate Stress 14-26	45 (26.47%)	55 (39.28%)	100 (32.25%)
High Stress 27-40	05 (2.94%)	10 (7.14%)	15 (4.83%)
Total	170 (100%)	140 (100%)	310 (100 %)

Table 2: Distribution of ABO Blood Groups in the study population .

Blood Groups	Males No. (%)	Females No. (%)	Total
A	40 (23.52%)	32 (22.85%)	72 (23.22%)
B	53 (31.17%)	48 (34.28%)	101 (32.58%)
AB	12 (7.05%)	11 (7.85%)	23 (7.41%)
O	65 (38.23 %)	49 (35%)	114 (36.77%)
Total	170 (100%)	140 (100%)	310 (100 %)

Fig 1: Distribution of perceived stress among different blood groups.



DISCUSSION

This present study was done in medical and dental students who were in first and second year. Medical education has a vast curriculum with lots of hard work needed for students. Students have to spend lots of time in studies unlike other fields. Early medical student's academic performance can trigger stress symptoms such as anxiety, sleep disorders or changes in appetite and breathing phenomenon. Our study found that blood group was an eminent factor for stress in students. Blood group A had high prevalence of stress of 38.26 % followed by blood group B (24.34 %), AB (20 %) and O (17.39 %) respectively. Similar to our study, medical students stated increased levels of academic stress, which plays a vital role in the overall mental health and academic achievements of medical students, they showed more signs of stress, anxiety, and depression than other university students.[14] Higher stress level in blood group O was found in another study[15] which is in contrast to the present study finding of least perceived stress level in O blood group medical and dental students. However, our study result is consistent with Furukawa theory that blood type A people get stressed easily and have high blood level of cortisol, stress hormone while on the other hand O blood type individuals are strong, enduring and referred to as warriors by Japanese.[16] Our finding is similar to the result of study conducted in Nepalese Medical College which showed highest mean score in blood group A students.[17] Peoples of different ABO blood types have variation in the ways to respond to stress management. The surface of membrane of RBC's contains a variety of genetic material (antigen).[18, 20] The present study is in contrast with the study by Yogeeshwaran et al.[21] which showed no association of blood groups with stress among medical students (P > 0.903).

CONCLUSION

Although perceived stress was highest for a blood group A followed by B blood group and least in O blood group, statistically significant differences were not found among different ABO blood group medical and dental students (P> 0.05)). Furthermore, larger sample size research in the particular study should be done to ensure the

exact link between stress and ABO blood groups.

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Conflict of Interest: None.

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