Original Article

Survey of Health Indices in New Entering Students in Zahedan University of Medical Sciences in Southern Iran

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Abstract

Young people represent a large proportion of each population and attention to their health indicators improve the community health. This paper aimed to study health indices in new entering students of the Zahedan University of Medical Sciences in Southern Iran. A total number of 361 new entering students, 260 (72.02%) girls and 101 (27.98%) boys, were participated in this cross-sectional study. weight and height of the students were measured and then body mass index was calculated through dividing weight in Kilogram by height in square meters (kg/m2). Two ml blood in a tube containing EDTA anticoagulant for hematologic parameters and two ml blood for blood sugar test were taken from students. Among the participants, 29.6% of the students lived with their parents, 3% of the boys and 15% of the girls were underweight, meanwhile, 5% of the boys and 2.4% of the girls were overweight and 0.8% of the students were obese. Result showed that, blood glucose in 2.8% of the students was higher than normal, hemoglobin in 11.1% of participants was less than 12 g/dl, mean corpuscular volume (MCV) and mean corpuscular hemoglobin (MCH) were less than normal range in 14.1% and 22.7% of the students, respectively. Hypochromic and microcytic anemia was a health problem among college students in this area of Iran. Accurate assessment of the causes of anemia is recommended, which can be effective in improving new entering students health.

Key words: Body mass index, Health, Hematologic parameter, Student

INTRODUCTION

One of the most important indices of countries development is health level and well-being of the community. The future of a community is based on its adolescents and youth dynamism and mental and physical health, so having healthy and strong people can be considered as one of the greatest national capital for a community. In recent years, health is known as a human right and a worldwide social goal which is necessary to meet basic needs and improve quality of human life and should be available to all people.[1]

Health has many dimensions, including physical, mental, spiritual, emotional and social aspects among which physical dimension is the easiest to assess. Physical health signifies a full normal body performance and that body organs size is normal and operate properly.[2] For this reason, in the United Nations third millennium Development Programs, concept of "health" is one of the important parameters and is considered as one of the main indicators of community development.[3]

Young and teenage students are a wide class of the population who make up a community and due to the vulnerability of this big group, paying attention to their health and maintaining that has a great undeniable impact on national health promotion.[4,5] Among health assessment indicators hematological parameters of individuals can be noted.

Paying attention to hematological indices is necessary in monitoring individuals health and helping physicians to diagnose diseases.[6] Physical growth parameters including

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height, weight and body mass index (BMI) are the other indicators of student health.[7]

Given that today's students are the future parents and administrators of our society, assessing their health status is very important. Therefore, knowing the use of health indicators in diseases prevention and improving health standards as a key component of health can provide efficient life continuance and healthy advancement of college students. Hence, in this study we examined hematologic and health indicators of students at Zahedan University of Medical Sciences.

METHODS

This cross-sectional study examined health and hematologic indicators of new entering students in 2013 (361 cases). The study protocol was approved by the ethics committee in Research Deputy of Zahedan University of Medical Sciences. Students' demographic information was collected using a questionnaire which was designed for this purpose. The students' height and weight were measured using SECA microbalance (Germany) and then their BMI was calculated dividing weight in Kilogram by height in square meters (kg/m2). Two ml blood in a tube containing EDTA anticoagulant and 2 ml blood in tubes without anticoagulant were taken from students. White blood cell (WBC), red blood cell (RBC), platelets (PLT), hemoglobin (Hb), hematocrit (HCT), mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), the amount of hemoglobin a certain red blood cell (MCHC) and red cell distribution width (RDW) count parameters were measured on anticoagulant sample by Sysmex automatic counting machine (Japanese model K1000). FBS with specific sets of QQ was examined using QQ auto-analyzer made in QQ and hepatitis B surface antigen was analyzed using QQ on serum blood. Demographic information analyzed blood parameters and students' weight and height were recorded in a questionnaire and each student was assigned a code. Then, the data were entered in SPSS software and were analyzed using descriptive statistics indices.

RESULTS

In this study, 361 students, 101 (27.98%) male and 260 (72.02%) females, were studied. Regarding ethnicity 124

(34.35%) were Sistani, 59 participants (16.34%) were Balouch and 178 (49.31%) were from other provinces of Iran. 107 students (29.64%) lived with their parents, while 254 students (72.36%) were at the dormitory. In terms of their educational levels: 261 (72.30%) of the university students were educating for bachelor's degree, 13 (3.60%) for a MSc degree and 88(24.38%) for MD degree. The mean age, height, weight and BMI of the student were 21.4±4 years, 163.7±7.5 cm, 56.1±8.6 kg and 20.8±2.2, respectively. Frequency distribution of the parameters mentioned above according to the gender is shown in Table 1. The WHO has divided the subjects into four groups according to BMI; underweight, normal, overweight and obese.[8] The results of the study results, based on this classification, are shown In Table 2.

The mean blood glucose level for the population studied was 89.5±10.4 mg/dl. In the case of, blood glucose in 87% of students was less than 100, in 10.2% of the students was between 100 to 110, and in 2.8% of them was higher than normal. Among the participants, two students were positive for HBs Ag.

Hematological parameters indices in the students studied are shown in Table 3 and their distribution by gender is shown in Table 4.

DISCUSSION

In this study, health-related factors were assessed in 361 students of Zahedan University of Medical Sciences. The results indicated that the mean BMI was 21.2 in boys and 20.6 in girls, 11.6% of the students were underweight, while 4.4% were overweight and 0.8% were obese. In a previous study in 2001, in Zahedan medical University, BMI was 21.7 and 21.6 in boys and girls, respectively, 18.3% were underweight and 12.9% were overweight and 1.3% were obese.[9] The results showed that after 10 years; 6.7% reduction in the number of low-weight and 8.5% in over weight and 0.5% in the obese students were happened. WHO defined individuals with BMI less than 18.5 as low weight, between 18.8-25 as normal-weight, between 25-29.5 as overweight and over 30 as obese.[10] In a study conducted in Esfahan, 19.4% of students were classified in the range of underweight,16% in the range of overweight

Table 1: The frequency distribution of students' weight, height and body mass indexes in Zahedan University of Medical Sciences

Variables	Male				Female				P
	N	Minimum	Maximum	Mean±SD	N	Minimum	Maximum	Mean±SD	
Weight (kg)	101	45	90	7.3±62.9	260	40	90	7.5±53.5	0.001
Height (cm)	101	155	180	5.7±171.7	260	150	180	5.6±160.7	0.001
BMI (kg/m²)	101	18.2	30.4	21.2±1.8	260	16.5	32	20.6±2.4	0.02

and 2.2% in the range of obese.[11] Among the causes of changes that lead to an increase in the normal range, the increase in people's awareness during a ten- year period, paying attention to the daily calorie balance and also a lot of interest in having a fit body can be noted.

Given that students studying in different universities have different requirements for economic, social and life style differences are justified.

The results also showed that the parameters of hemoglobin, hematocrit and RBC values mean in male and female students have a statistically significant difference (p < 0.05). 40(11.1%) participants have less than 12g/dl hemoglobin. The frequency distribution was 5 (12.5%) and 35 (87.5%) for

male and female, respectively. Being microcytic hypochromic for red blood cells in hematology can be evaluated measuring MCV and MCH indexes. MCV for 14.1% and MCH for 22.7% of the students were less than normal range (80 fl and 27 pg). The frequency distribution for boys and girls for MCV<80 was 33.3% and 66.7% and for MCH<27 was 28% and 72% respectively. Muhammad et al. reported Mean Hb and HCT in Peshavar students were significantly different between boys and girls students (P<0.01) and 17.6% of males and 23.3% of females, MCV was less than 80 fl, also MCH was less than 27 pg for 36.6% of males and 40.2% of females.[12] According to RBC indices, MCV and MCH values for 21.4% and 19.8% Emirates female student were less than normal.[13] About the difference between hemoglobin, hematocrit and number of RBC parameters' mean in boys and girls, the role of sex hormones in increasing these parameters in boys is more than girls. Microcytic hypochromic can be associated with iron deficiency anemia, thalassemia in the study population. Considering that 50% of the subjects are native (Sistani and Balouch) and the fact that, according to conducting studies, β- thala gene abundance in different areas of the province vary from 7 to 13 percent.[14] Therefore, portion of hypochromic microcytic anemia can be liked to high prevalence of thalassemia gene in this area. Among the reasons for the high thalassemia prevalence can be noted being in the sub-tropical and malaria-prone regions which caused natural selection that the abundance of thalassemia and G6PD enzyme deficiency genes in this province.[15] On the other hand, given that iron deficiency is one of the most causes of hypochromic microcytic anemia in developing countries, complimentary testing such as HbA2, ferritin, Hb electrophoresis and molecular tests is recommended to differentiate the causes of anemia.

CONCLUSIONS

Anemia was prevalent among college students. In this area of Iran this can be a health problem the students future and therefore, accurate assessment of the causes of anemia is recommended to improve their health.

Table 2: Frequency distribution of body mass index (BMI) in Zahedan University of Medical Sciences students

Gender	Male		Female		Total		P
	N	%	N	%	N	%	
BMI							
Underweight	3	3	39	15	42	11.6	
Normal	92	91.1	208	80	300	83.1	
Overweight	5	5	11	4.2	16	4.4	
Obese	1	1	2	0.8	3	0.8	
Total	101	100	260	100	361	100	

Table 3: Descriptive statistics of hematological parameters for the students studied in Zahedan University of Medical Sciences

Variable	N	Min	Max	Mean±SD
RBC (10^6/mm^3)	361	3.44	7.2	4.8±0.5
Hb (g/dl)	361	9.4	19.7	13.7±1.6
HCT (%)	361	30.4	54.1	41.8±3.9
MCV (fl)	361	59	99.6	86.5±6.8
MCH (pg)	361	17.7	96.1	28.9±5.5
MCHC (g/dl)	361	27.7	9.37	32.8±1.7
RDW (%)	361	10.1	19.9	12.9±1.2
WBC (10^3/mm^3)	361	3.2	13.6	6.5±1.6
PLT (10^3/mm^3)	361	109	529	245.3±54.3

Table 4: Descriptive statistics of hematological parameters in students studied by gender in Zahedan University of Medical sciences

Variable	Male			Female			P
	Mean±SD	Minimum	Maximum	Mean±SD	Minimum	Maximum	
RBC (10^6/mm^3)	0.6±5.3	3.4	7.2	0.4±4.6	7.3	6.1	0.001
Hb (g/dl)	1.6±15.1	10.4	19.7	1.2±13.2	9.4	17.5	0.001
HCT (%)	3.8±45.4	31.6	54.1	3±40.4	30.4	49.3	0.001
MCV (fl)	6.5±85.8	63.7	99.6	6.9±86.8	59	98	0.191
MCH (pg)	3.3±28.8	17.7	39.9	6.2±28.9	18.8	96.1	0.846
MCHC (g/dl)	1.6±33.3	27.9	36.6	1.7±32.7	28	37.9	0.003
RDW (cv %)	1.312.9	1.10	19.9	13±1.1	3.10	19	0.43
WBC (10^3/mm^3)	1.4±6.2	2.3	11	1.6±6.7	6.3	13.6	0.008
PLT (10^3/mm^3)	49.9±241.8	109	433	55.9±246.7	127	529	0.44

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REFERENCES

1. Frenk J. Dimensions of health system reform. Health Policy 1994; 27: 19-34.
2. Hanney SR, Gonzalez-Block MA. Organising health research systems as a key to improving health: The World Health Report 2013 and how to make further progress. Health Res Policy Syst 2013; 11: 47.
3. Haines A. Informed choices for attaining the Millennium Development Goals: towards an international cooperative agenda for health-systems research. The Lancet 2004; 364: 997 - 1003.
4. Jacobson LD, Wilkinson CE. Review of teenage health: time for a new direction. Br J Gen Pract 1994; 44: 420-424.
5. Tang HK, Dibley MJ, Sibbritt D, Tran HM. Gender and socio-economic differences in BMI of secondary high school students in Ho Chi Minh city. Asia Pac J Clin Nutr 2007; 16: 74-83.
6. KA Koram KA, Addae MM, Ocran JC et al. Population Based Reference Intervals for Common Blood Haematological and Biochemical Parameters in the Akuapem North District. Ghana Med J 2007; 41: 160-166.
7. Gauld RF, Rakhir SM. The nutritional status of disabled children: A cross-sectional survey. Eur J Clin Nutr 2004; 53: 915-919.
8. WHO., Expert., Consultation. Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. Lancet 2004; 363: 157-163.
9. Mortazavi Z, Shahrakipour M. Body mass index in zahedan University of Medical Sciences Students. Zahedan journal of Research in Medical Sciences 2002; 4: 81-86.
10. Hubbard VS. Defining overweight and obesity: what are the issues? Am J Clin Nutr 2000 72: 1067-1068.
11. Moafi A, Rahgozar S, Ghias M et al. A study on body mass index, blood pressure, and red blood cell indices in new entering students of the university of isfahan. Int J Prev Med 2011; 2: 280-285.
12. Muhammad TK, Tasleem A, Mussarat N. Prevalence of anemia among university of peshawar students. JPMI 2010; 24: 265-269.
13. Sultan AH. Anemia among female college students attending the University of Sharjah, UAE: prevalence and classification. J Egypt Public Health Assoc 2007; 82: 261-271.
14. Miri-Moghaddam E, Eshghi P, Sanei Moghaddam E, Hashemi S. Prevalence of hemoglobinopathies in Sistan and Balouchistan province in the southeast of Iran. Sci J Iran Blood Transfus Organ 2013; 9: 406-413.
15. Miri-Moghaddam E, Mortazavi Y, Nakhaee A, Khazaei Feizabad A. Prevalence and molecular identification of the mediterranean variant among G6PD-deficient Sistani and Balouch males in Southeastern Iran. Biochem Genet 2013; 51: 131-138.