Biosciences, Biotechnology Research Asia Vol. **5**(1), 161-170 (2008)

Retrospective case study of students medical tests/admissions in the University of Ado-ekiti, Nigeria from 1990 – 1999

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(Received: April 18, 2008; Accepted: June 10, 2008)

ABSTRACT

The study reported here was based on the case study of students medical tests/admissions in the University of Ado-Ekiti Health Centre for ten years (1990-1999). The data analysed were obtained from the students folios in the Health Centre. The results showed the following information for both male and female subjects: number of subjects was 478 (240 females and 238 males); age ranged from 17-31 years; temperature range was 35-40°C for males and 36-40°C for females; blood pressure was 90-190mmHg (systolic) males and 90-180mmHg (systolic) females, for diastolic, 50-100mmHg (males) and 60-80mmHg (females); height range was 1.4-2.0m (males) and 1.5-1.8m (females); the urine pH values ranged from 5-9 (males) and 5-9 (females); packed cell volume (PCV) ranges were 15-55% (males) and 18-55% (females); body mass index (BMI) range values were 15.6-34.9kgm^{-2} (males) and 15.6-28.1 kgm^{-2} (females). Our values in temperature, blood pressure, urine, PCV and BMI showed that some of the subjects would suffer some deleterious diseases. The two most common diseases among the females were malaria, 121 (50.4%)and typhoid fever, 16 (6.7%); the same diseases were also the most common in the males, 115 (48.3%) and 16 (6.7%) respectively. These results showed that the students environments were mostly unhygienic.

Key words: Case study, students medical tests, UNAD.

INTRODUCTION

It is a common phenomenon for prospective students in tertiary institutions and job seekers to undergo medical tests to assess their suitability or otherwise for studentship or employment. Although a medical test failure might not result in total rejection of such a candidate it would however assist the institution to assist such a candidate medically.

Once a student or job seeker has been accepted by an institution the results of such medical tests are kept in the individual folio. Such folios are kept for such candidates as long as the individual remains in such establishment. Such folio information on the medical test would include the followings: temperature (°C), blood packed cell volume (PCV, percentage), body mass index (BMI, kgm^{-2}) and the age in years. The sex of an individual would also be included.

This University issued a circular to the students on 17-02-04 that only 1265 out of about 3400 students that were in the 100 level registered in the University Health Centre. In addition, it was learnt that many students at the 200 to 500 levels were yet to register in the Health Centre. This has always been the case and this might be the reason while the total number of students we could work with was only 478.

The aim of this project was to collect the students folios, examine their medical records based on medical tests and medical admissions during illness. The investigation spanned ten years (1990

-1999) involving a population of 478 subjects (240 females and 238 males). In addition to the routine medical test results seen in the folios, this study also assisted us to look at the pattern of diseases. This type of information would assist us to make recommendations on the improvements of the life style of the subjects.

MATERIAL AND METHODS

The subjects whose data were collected were newly admitted students who underwent medical tests as one of the requirements for the confirmation of University admission at the University of Ado Ekiti Health Centre. The data were as contained in their folios for a period spanning ten years (1990-1999). The folios also contained the various diseases suffered by the subjects for the same period. To collect the data, permission was obtained from the Director of Medical Services. A total of 478 subjects with 240 females and 238 males were involved in the study. The ages of the subjects ranged from 17-29 years for females and 17-31 years for the males. The data were collected strictly based on confidentially of the subjects.

The temperature was measured by the degrees centigrade thermometer (Surgifriend, England). The thermometer reading ranged from 34-43^{o}C. The blood pressure was measured with the use of mercury sphygmomanometer (blood pressure cuff) with a guage. Body weight was taken with the use of beam balance with non-detachable weights (Neylux Quality Product, England). Body weight was recorded to the nearest 0.1 kg[1]. The height was measured by anthropometer (Neylvex Quality Products, England). Urine pH analysis was carried out using the following instruments: urine sample bottle, slip, desiccant stopper, vial meditest Combi 3A (Marchery -Nagel, D – 52348 Durew); test slip was used to measure the pH, after 60 seconds comparison was made between reaction colours with the colour-scale as labelled on the medi-test container. The colours are labelled as follows: pH: orange (5), yellow (6), faint green (7), light green (8) and deep green (9). The packed cell volume (PCV) (haematocrit) determination involved the use of micro-haematocrit tube, EDTA (eththyene–diaminetetra acetic acid, anticoagulant), crystalseal (Hawkesley and Sons Ltd., England), PCV machine (micro-Haematocrit reader, Hawsley, England). Body mass index (BMI): weight to height ratio are of two major types which are relative weight and power type indices. The relative weight expresses the weight of a given subject as a percentage of the average weight of persons of the same height. Power type indices expresses the weight relative to some power function of height relative to some power function of weight. The numerical values of each of these indices depend on the units of measurement employed (e.g. meters and kilograms or inches and pounds). Power type indices for weight/height ratios include the following:

Weight/height ratio (Wt/ht^2);
Quetelet's index [$Wt / (ht)^2$];
Ponderal index ($Ht /3Wt$);
Benn's index [$Wt/(ht)^p$].

Quetelet's Index [$Wt / (ht)^2$] has been considered the best 'Body Mass Index' for most adults, this is least biased by height and easily calculated[2]. Furthermore, information on age and sex was obtained from the students folios. Efforts were made to make sure that all the data collected were authentic.

The statistical works carried out were the determination of range, mean, standard deviation and coefficient of variation percent.

RESULTS

The results for temperature, blood pressure (systolic and diastolic), body weight, height, urine pH, packed cell volume (PCV) and body mass index (BMI) are all shown in Table 1. Both ages and sexes were also included. The number of subjects per sex and per age group were also indicated. Table 2 contains the identified diseases among the undergraduate students of the University of Ado-Ekiti (1990-1999).

The temperature readings for all the ages and the sexes were very close with majority of subjects within a narrow range of an average of 37°C for the normal body temperature. The coefficient of variation percent (CV%) for males ranged from 0.57 (age 29 years) to 3.38 (age 19 years) and for female

Table 1: Various parameters recorded during students' medical tests on University admission

S. No.	Sex	Number	Age (years)	Statistics	Temp. (°C)	Blood pressure Systolic	Blood pressure Diastolic	Weight (kg)	Height (m)	Urine pH	Packed cell volume (%)	BM1[a] (kg m^{-2})
1.	Male (M)	3	17	Mean	37.53	116.7	70	57.67	1.66	7.33	40.33	21.0
				Range	36.7-38.9	110-120	70-70	55-62	1.58-1.80	6.0-8.0	38-42	19.13–22.43
				SD[b]	1.19	5.8	0.0	3.8	0.12	1.15	2.08	1.70
				CV%[c]	3.17	4.97[-d]	6.59	7.23	15.69	5.16	8.10	
	Female (F)	5	17	Mean	37.62	120	74	52.2	1.61	6.4	37.6	20.12
				Range	36.8-38.5	110-130	70-80	44-66	1.50-1.66	5.0-7.0	24-46	16.73-23.95
				SD	0.78	7.1	5.5	9.07	0.07	0.89	8.62	2.58
				CV%	2.07	5.92	7.43	17.38	4.348	13.91	22.93	12.82
2.	M	7	18	Mean	37.16	109.7	71.43	60.14	1.64	7.43	41.71	22.44
				Range	36.2-38.0	98-120	60-80	55-67	1.55-1.78	5.0-9.0	35-48	19.59-24.97
				SD	0.49	6.37	9.0	4.82	0.10	1.51	4.92	1.9
				CV%	1.32	5.81	12.6	8.01	6.10	20.32	11.80	8.47
	F	12	18	Mean	36.7	110.8	70.83	55.08	1.61	6.13	38.83	21.22
				Range	36.0-38.9	90-120	50-80	45-72	1.45-1.75	5.0-7.0	32-46	15.94-28.13
				SD	0.8	9.96	9.96	8.97	0.09	0.68	3.66	3.38
				CV%	2.18	8.99	14.06	16.29	5.59	11.09	9.43	15.93
3.	M	21	19	Mean	37.28	115.95	75.33	60.047	1.66	6.40	40.048	21.94
				Range	36.0-39.5	90-130	55-90	49-73	1.45-1.84	5.0-9.0	22-50	18.87-27.47
				SD	1.23	10.91	10.31	6.82	4.10	1.26	6.29	2.58
				CV%	3.38	9.41	13.69	11.36	6.02	19.69	15.71	11.76
	F	12	18	Mean	37.29	115.0	71.67	57.17	1.64	6.58	38.5	21.28
				Range	36.4-40.0	90-150	60-90	45-69	1.55-1.72	5.0-8.0	34-41	16.53-25.39
				SD	1.28	15.08	9.37	7.16	0.06	0.79	2.28	2.52
				CV%	3.29	13.11	13.07	12.52	3.66	12.0	5.92	11.84

4.	M	32	20	Mean	36.87	114.06	72.5	61.34	1.66	6.36	40.84	22.47
				Range	36-39	90-180	55-90	45-80	1.45-1.84	5.0-9.0	34-49	18.21-32.05
				SD	0.80	17.01	10.24	6.63	0.09	1.03	3.73	2.91
				CV%	2.17	14.91	14.12	10.81	5.42	16.19	9.13	12.95
	F	40	20	Mean	37.51	107.95	69.75	59.05	1.64	6.45	38.23	21.89
				Range	36-39	90-130	60-90	40-75	1.50-1.80	5.0-9.0	30-51	15.63-27.73
				SD	1.01	8.66	8.0	7.58	0.08	1.13	4.44	2.63
				CV%	2.69	8.02	11.47	12.84	4.88	17.52	11.61	12.01
5.	M	41	21	Mean	36.84	111.22	72.44	57.67	1.66	7.33	4.33	21.0
				Range	36-40	90-140	60-95	55-62	1.58-1.80	6.0-8.0	38.42	19.13–22.43
				SD	0.88	8.72	7.92	3.8	0.12	1.15	2.08	1.70
				CV%	2.39	7.84	10.93	6.59	7.23	15.69	5.16	8.10
	F	17	21	Mean	37.01	110.29	71.76	52.2	1.61	6.4	37.6	20.12
				Range	36-38.6	100-130	60-90	44-66	1.50-1.66	5.0-7.0	24-46	16.73-23.95
				SD	0.82	8.38	7.28	5.72	0.07	1.01	6.39	1.78
				CV%	2.22	7.59	10.14	10.28	4.35	15.61	17.87	8.33
6.	M	25	22	Mean	37.9	112.4	71.52	62.44	1.69	6.62	42.36	21.71
				Range	36-39.5	90-130	60-90	39-86	1.5-1.98	5.0-8.0	15-55	17.33-27.14
				SD	1.22	9.26	8.747	10.71	0.13	0.90	7.85	1.96
				CV%	3.22	8.24	12.23	17.15	7.69	13.59	18.53	9.03
	F	28	22	Mean	37.18	06.96	67.68	55.04	1.64	6.446	37.75	20.47
				Range	36-39	90-130	60-90	38-66	1.5-1.8	5.0-8.0	18-55	16.89-24.14
				SD	0.74	10.48	8.33	6.74	0.09	1.10	8.23	1.68
				CV%	1.99	9.79	12.31	12.25	5.49	17.06	21.80	8.21
7.	M	31	23	Mean	37.27	117.45	75.0	63.46	1.71	6.77	43.71	21.63
				Range	36-39.5	90-140	60-100	45-80	1.55-1.85	5.0-9.0	39-50	18.13-27.55
				SD	1.05	17.24	10.0	7.66	0.08	0.92	3.78	2.33
				CV%	2.82	14.69	13.33	12.67	4.68	13.58	8.65	10.77
	F	26	23	Mean	37.24	110.19	73.08	57.346	1.63	7.08	40.346	21.69
				Range	36-40	90-130	60-90	45-71	1.45-1.77	5.0-9.0	33-48	18.19-27.64
				SD	1.05	9.64	9.28	7.12	0.07	1.045	4.146	2.47
				CV%	2.82	8.75	12.69	12.42	4.29	14.76	10.28	11.39

8.	M	25	24	Mean	37.36	114.2	76.8	62.92	1.69	6.62	39.96	21.86
				Range	36.4-39.5	90-130	60-90	45-83	1.50-1.85	5.0-8.0	20-50	17.99-25.78
				SD	0.85	8.86	8.52	9.19	0.10	0.99	7.67	2.51
				CV%	2.28	7.76	11.09	14.61	5.92	14.95	19.19	11.48
	F	20	24	Mean	37.76	113.5	72.23	58.55	1.68	6.73	38.45	20.89
				Range	36-39.8	90-150	60-85	47-75	1.50-1.83	5.0-8.0	30-49	17.99-24.14
				SD	1.09	15.31	11.29	7.0	0.10	1.19	5.75	2.05
				CV%	2.89	13.49	15.63	11.96	5.95	17.68	14.95	9.81
9.	M	32	25	Mean	37.51	111.56	72.03	58.09	1.647	6.86	39.03	21.31
				Range	36-39	90-140	60-90	38-75	1.45-1.79	5.0-9.0	19-49	17.85-24.48
				SD	1.11	9.54	7.71	7.97	0.09	0.99	6.72	2.23
				CV%	2.96	8.55	10.70	13.41	5.46	14.43	17.22	10.46
	F	17	25	Mean	37.19	109.41	69.41	57.35	1.63	6.29	38.41	21.62
				Range	36-40	90-130	50-90	47-75	1.55-1.80	5.0-8.0	19-48	17.69-27.55
				SD	0.89	12.98	10.29	8.70	0.07	1.26	7.43	2.51
				CV%	2.39	11.86	14.82	15.17	4.29	20.03	19.34	11.61
10.	M	17	26	Mean	37.22	110	70.59	61.34	1.71	6.44	42.76	21.05
				Range	35-39	90-130	60-80	50-77	1.59-1.81	5-8	31-48	16.67-26.89
				SD	1.03	12.247	6.59	8.02	0.06	1.12	4.22	2.61
				CV%	2.77	11.13	9.34	13.07	3.51	17.39	9.87	12.39
	F	7	26	Mean	37.09	121	80	57.71	1.67	6.57	36.0	20.69
				Range	36-37.8	110-180	70-120	49-68	1.50-1.75	5-8	22-42	18.71-22.31
				SD	0.67	26.10	18.26	6.18	0.09	1.27	7.0	1.51
				CV%	1.81	21.57	22.83	10.71	5.39	19.33	19.44	7.29
11.	M	6	27	Mean	36.57	110	73.33	63.67	1.73	7.0	45.33	21.32
				Range	35-38	90-125	60-80	55-76	1.5-1.8	6.0-8.0	41-49	18.38-24.44
				SD	0.97	12.649	8.16	8.29	0.12	0.89	2.66	2.33
				CV%	2.65	11.49	11.13	13.02	6.94	12.71	5.87	10.93
	F	9	27	Mean	37.14	109.44	68.89	58.44	1.69	6.89	36.33	20.49
				Range	36-39.5	100-125	60-80	50-70	1.54-1.80	5.0-9.0	21-50	18.37-22.34
				SD	1.29	8.82	6.01	7.55	0.09	1.45	7.89	1.46
				CV%	3.47	8.06	8.72	12.92	5.33	21.04	22.92	7.13

12.	M	5	28	Mean	37.14	120	76	66.4	1.72	6.2	44.4	21.83
				Range	36.8-38.0	110-150	70-80	60-74	1.65-1.75	5.0-7.0	38.51	19.59-27.18
				SD	0.49	17.32	5.48	5.73	0.04	0.84	4.93	3.33
				CV%	1.32	14.43	7.21	8.63	2.33	13.548	11.10	15.25
	F	3	28	Mean	36.93	100	63.33	61.0	1.72	7.0	39.0	20.61
				Range	36-37.8	90-110	60-70	54-68	1.60-1.79	6.0-8.0	34-43	19.04-12.71
				SD	0.90	10	5.77	7.0	0.10	1.0	4.58	1.40
				CV%	2.44	10	9.11	11.48	5.82	14.29	11.74	6.79
13.	M	3	29	Mean	36.57	116.67	73.33	63.33	1.68	6.5	49.67	22.34
				Range	36.4-36.8	110-120	70-80	58-70	1.62-1.75	6.0-7.0	49-50	20.55-23.62
				SD	0.21	5.77	5.77	6.11	0.07	0.5	0.58	1.60
				CV%	0.57	4.95	7.87	9.65	4.17	7.69	1.17	7.16
	F	4	29	Mean	36.88	110	70	57.75	1.62	7.5	37.75	22.35
				Range	36-38	100-120	60-80	55-60	1.50-1.76	7.0-8.0	20-48	19.37-26.22
				SD	0.85	11.547	8.16	2.22	0.11	0.6	12.23	3.01
				CV%	2.30	10.49	11.66	3.84	6.79	8.0	31.56	13.48
14.	M	6	30	Mean	37.4	115.5	74.12	74.33	1.72	6.67	43.5	25.31
				Range	36-39	98-145	60-95	57-85	1.56-1.85	5.0-8.0	40-48	20.19-34.93
				SD	1.13	17.248	12.0	9.63	0.10	1.03	3.02	5.20
				CV%	3.02	14.93	16.19	12.96	5.81	15.44	6.94	20.55
15	M	2	31	Mean	36.75	135	90	74	1.76	7.5	46	23.89
				Range	36.5-37	125-145	90-90	69-79	1.7-1.82	7.0-8.0	43-49	23.85-23.88
				SD	0.35	14.14	0.0	7.07	0.08	0.71	4.24	0.02
				CV%	0.95	10.47	-	9.55	4.55	9.47	9.2	0.08

[a]BMI = Body Mass Index;
[b]SD = Standard deviation;
[c]CV = Coefficient of variation percent;
[d]- = Not determined.

Table 2: Identified diseases among the undergraduate students of University of Ado-Ekiti (1990-1999)

S.o No.	Disease	Male (Number)[a]	Female (Number)[a]
1.	Food poison	3(1.26)	1(0.42)
2.	Pshychosis	3(1.26)	4(1.67)
3.	Anaemia	1(0.42)	2(0.83)
4.	Assault	1(0.42)	2(0.83)
5.	Depression	2(0.84)	3(1.25)
6.	Epilepsy	4(1.68)	1(0.42)
7.	STD[b]	5(2.10)	2(0.83)
8.	Hypertension	2(0.84)	3(1.25)
9.	Tyhoid fever	16(6.72)	16(6.67)
10.	Sickle cell	11(4.62)	12(5.0)
11.	Appendicitis	1(0.42)	2(0.83)
12.	Pneumonia	4(1.68)	4(1.67)
13.	UTI[C]	5(2.10)	2(0.83)
14.	Asthma	15(6.30)	10(4.17)
15.	Malaria fever	115 (48.32)	121 (50.42)
16.	Amoebiasis	8(3.36)	6(2.5)
17.	Injury	2(0.84)	2(0.83)
18.	Snake bite	1(0.42)	-
19.	Catarrh	1(0.42)	-
20.	Ulcer	2(0.84)	-
21.	Septicaemia	-	2(0.83)
22.	Dehydration	1(0.42)	-
23.	Allergic reaction	1(0.42)	
24.	Exhaustion	1(0.42)	-
25.	Rashes	1(0.42)	-
26.	Chest infection	2(0.84)	-
27.	Gastroenteretis	-	12(5.0)
28.	PUO[d]	-	1(0.42)
29.	Acute plasmodia	-	1(0.42)
30.	D and V[c]	-	1(0.42)
31.	Hepatitis	-	1(0.42)
32.	Enterocolitis	-	1(0.42)
33.	URTI[f]	9(3.78)	10(4.12)
34.	Abrasion	1(0.42)	10(4.12)
35.	PUD[g]	7(2.94)	7(2.92)
36.	Gastritis	5(2.10)	-
37.	Abdominal colic	2(0.84)	-
38.	P and D	1(0.42)	-
39.	RTA[h]	3(1.26)	-
40.	Vasoclusive crisis	1(0.42)	1(0.42)
41.	PID[i]	-	7(2.92)
42.	Pyelonepritis	-	1(0.42)
43.	Perexial of unknown organism		2(0.83)
44.	Recurrent emesis	1(0.42)	-

[a]Numbers in parentheses are in percentages;
[b]STD = Sexually transmitted diseases;
UTI = Urinary tract infection;
[d]PUO = Pyrexia of unknown;
[e]D and V = Diarrhea and vomiting;
[f]URTI = Upper respiratory tract infection;
[g]PUD = Peptic ulcer disease;
[h]RTA = Road traffic accident;
[i]PID = Pelvic inflammatory disease.

the range was 1.99 (age 22 years) to 3.29 (age 19 years) showing a coincidence of results of CV% at age 19 years for both sexes.

The CV% of the systolic blood pressure range was 4.95 (age 29 years) to 14.93 (age 30 years) in males and in females the range was 5.92 (age 17 years) to 21.57 (age 26 years). Again the CV% values were low and close for both sexes although the values were more scattered in the females. For the diastolic blood pressure the CV% range for males was 0.0 (ages 17 and 31 years) to 16.19 (age 30 years)and in females the range was 7.43 (age 17 years) to 22.83 (age 26 years). We have the same conclusion here as we have for the systolic blood pressure for both sexes.

The CV% of the weight levels have values of range 3.41 (age 25) to 17.15 (age 22 years) in the males but ranged from 3.84 (age 29 years) to 17.38 (age 17 years) in the females. The minimum and maximum range values in the CV% were close on pairwise comparison for both males and females respectively although with slight higher values in the females. Also it is instructive to note that the minimum range values were associated with the higher ages in both sexes. The CV% for the height ranged as follows: in females it was 2.33 (age 28 years) to 7.69 (age 22 years) and in females it was 3.66 (age 19 years) to 6.79 (age 29 years); the CV% were close and low for the age levels and the sexes.

The urine pH range levels were higher in the subjects for both sexes and ages when

compared with the CV% values stated in the above for other parameters. For example, in the males the range was 7.69 (age 29 years) to 20.32 (age 18 years) and in the females it was 8.0 (age 29 years) to 21.04 (age 23 years). The packed cell volume CV% levels have the following range values: for males it ranged from 1.17 (age 29 years) to 19.19 (age 24 years) and for females it ranged from 5.92 (age 19 years) to 31.56 (age 29 years) meaning that PCV was highly varied at age 29 years among the females although only four subjects were in this age bracket..

The calculated body mass index (BMI) CV% range was 0.08 (age 31 years) to 20.55 (age 30 yers) in the males while it was 6.79 (age 28 years) to 15.93 (age 18 years) in the females.

In Table 2, the most prevalent diseases in both males and females were typhoid fever, sickle cell anaemia, malaria and asthma.

DISCUSSION

The normal body temperature is 37°C, if it is above or lower than 37°C, it is a sign of one illness or the other[3]. The subjects above 37°C in the males were ages 22 years (38°C) and ages 17, 25 and 26 years (37.5°C), whereas ages 18, 20, 21, 23, 24, 28 and 30 years were within the normal 37°C but ages 27, 29 and 31 years recorded an average of 36.5°C. In the females ages 17 years (38.5°C), 20, 24 and 26 years (37.5°C) were above 37°C whereas ages 18 years (36.7°C) and 28 years (36.93°C) were below 37°C, hence ages (years) 19, 21, 22, 23, 25, 27 and 29 were within 37°C normal body temperature.

The normal systolic blood pressure is between (110 and 120) mmHg while the normal diastolic blood pressure is between (60 and 80)mmHg. Any reading that is higher or lower than standard is a sign of hypertension or hypotension respectively[3]. The systolic blood pressure levels among the males were within the normal range for the ages 17 to 30 years but with an average value of 135±14.14mmHg and a CV% of 10.47. This might lead to the development of hypertension in this age group where the systolic blood pressure value actually ranged 125-145mmHg. For the females, only ages 26 group had a slight higher value of 120. 5mmHg whereas ages (years) 20, 22, 25, 27 and 28 fell below the minimum of 110mmHg making them liable to suffer from hypotension. In the diastolic range, all the female subjects were within the normal range of 60-80mmHg but the males of age group 31 years had 90mmHg diastolic value confirming their liability to suffer the disease of hypertension.

Indices derived from growth measurements are constructed from two or more raw anthropometric measurements and are simple numerical ratios such as weight / (height)^2, or combinations such as weight for age, height for age, and weight for height. These should not be written as weight/age, height/age, and weight/height to avoid confusion with the numerical ratios. Indices are an essential part of the interpretation of anthropometric measurements[4]. Weight/height ratios are frequently used for adults. They measure body weight corrected for height, with the underlying assumption that the ratios are highly correlated with obesity. Hence these ratios are frequently called obesity or body mass indices[5]. A time graph of the weight against the ages will show that the weights of males were consistently higher than the weights of females of corresponding ages. There were drops in the increasing weight (against age) at ages (years) 21, 25 and 29 for both sexes but a leverage of weight increase for males at ages (years) 23-24 and 30-31. The pattern of height against the age was as depicted in the weight against the age with males being consistently taller than females on age basis. Drops in height in particular ages were also observed for both sexes with leverage observed at ages 19-20 years for both sexes. Both the values of weight and height were involved in the calculation of the body mass index.

Many investigators consider Quetelet's index to be the best body mass index (BMI) for most adult population groups, as it is the least biased by height, in fact it is largely independent of actual height and easily calculated[2,6,7,8]. It also correlates with many health-related indices such as mortality risk[9]. In our results the levels of BMI were slightly higher in females only at ages (years) 23, 25 and 29 whereas in all other age groups, the BMI levels in the males were consistently higher than in the

females. The general standard for BMI for both sexes is 20-25 kgm^{-2} or an average of 22 kgm^{-2}, [10]. In our report only males in the age group of 30 years had an average value of 25.31 kgm^{-2}. This group actually constituted a population of two subjects with a BMI range of 20.19 – 34.93 ± 5.20 kgm^{-2} and a CV% of 20.55. In the survey of heights and weights of adults in Great Britain[6], values for Quetelet's index of < 20 were regarded as indicative of underweight,>25 indicative of overweight and >30 as obese. The implication from our results is that no subject was underweight and only one age group was overweight (20.19 – 34.93 kgm^{-2}; mean 25.31 ± 5.20 kgm^{-2}.) In the classification used for BMI by Health and Welfare Canada[8] showed that values <20 may be associated with health problems for some individuals, values between 20-25 were ascribed as 'ideal' index range associated with the lowest risk of illness for most people while 25-27 may be associated with the health problems for some people. The data collected by Eveleth and Tanner[12] show that young Indonesian adults had on average a BMI of 19, which is close to the lower end of the desirable range. Intakes of energy or protein above as well as below those needed for optimal function may be detrimental if they exceed the adaptive capacity of the organism. Excessive energy intakes lead to obesity, with reductions in cardiorespiratory efficiency, physical performance and endurance[10].

pH value of fresh urine of healthy people ranges between 4.5-8.0. pH should be slightly acidic. Many pH values were within the range of 5.0 -9.0 but no value was lower than 4.5. Urine becomes excessively alkaline with alkalemia infection of urinary tract and a diet high in vegetables or citrus fruits. Acidic urine is associated with academia, diarrhoea, starvation and a diet high in meat product or canberries[11]. The average pH values in males were higher than in the females in the ages (years) 17, 18, 22, 23, 25 and 27 but similar for both sexes in 29 (females) and 31 (males).

The normal value of packed cell volume for male and female is between (40-50)% and (37-47)% respectively. Packed cell volume is the volume of red blood cells in one decilitre of blood. In our results the males PCV were only lower than the minimum in ages (years) 21 and 25 while age 29 years was 50%. In the females, ages (years) 21, 26 and 27 were lower than the minimum while only age 23years met the maximum. Minus ages 21 and 25 years in the males, iron-deficiency anaemia would not be expected among the males. In the females iron-deficiency anaemia might be high because most of them just met the minimum level of PCV; this is more important when it is remembered that they were in their child bearing age.

In Table 2, typhoid fever (16 subjects with 6.72%) in males and 16 subjects (6.67%) in females was found to be one of the most prevalent disease among the students. Along this high disease incidence were sickle cell, 11 (4.62%) males and 12 (5.0%) females; asthma, 15 (6.30%) males and 10 (4.17%) females; malaria fever, 115 (48.32%) males and 121 (50.42%) females; amoebiasis, 8 (3.36%) males and 6 (2.50%) females and PUO, 7 (2.94%) males and 7 (2.92%) females. Forty-four different types of diseases were identified for the students. Many of these diseases could be attributed to the unheigenic environment where the students live; such diseases were typhoid fever, gastroenteritis and amoebiasis which are all due to drinking of contaminated water or food; malaria fever due to stagnant water around the living areas and congestion of living areas resulting into asthma and pneumonia. Hypertension here if not due to heredity then it would be due to life style, also sexually transmitted disease would also be due to life style.

From the above results, from: anthropometric measurements, haematological markers and morbidity data, it would be necessary to carry out this type of study on regular basis in order to give the necessary advice on how to maintain a good health. It is assumed that our results here would serve as a baseline information for such studies.

ACKNOWLEDGEMENTS

We acknowledge with deep appreciation the co-operation of Dr. P.O. Omoniyi during the collection of the data for this study. Dr. Omoniyi is the Chief Medical Director, University Health Services.

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