QUALITY OF STUDENTS ENROLLED IN VETERINARY EDUCATION IN SUDAN

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Abstract: This study was carried out to compare the traits of undergraduate students of four veterinary faculties in Sudan; namely of universities of Khartoum (U of K), Sudan (SUST), Bahari (U of BH) and Butana (U of B). Additionally, the study draws the attention of specialists in the field of higher education; veterinary educators and those interested in veterinary education to the importance of these traits when admitting students to this vital specialization. A simple closed ended questionnaire was distributed to 525 undergraduates of the aforementioned faculties to give their age, gender, high school they attended, the frequency they took high school certificate (HSC) exams, the percent that qualify them to enter the faculty and their type of admission. The number of accurately filled questionnaires recovered was 394 (75% recovery rate). The results of this study showed that the students' traits vary significantly (p<0.001) with faculty. In conclusion the quality of undergraduate veterinary students in Sudan varies with faculty. Thus it is expected that these faculties graduate veterinarians of varying quality; whatever the academic and material potential of these faculties are similar or not.

Keywords: Education; quality; students' traits; veterinary.

Introduction

As a result of the unprecedented boom in the field of veterinary education that prevails in many countries of the world; especially the western countries; it is very necessary that the Sudanese ministry of higher education (MHE) as well as the veterinary educators pay attention to the quality of students admitted to veterinary colleges and the veterinary education they offer. There are many quality standards and regulations that must be applied before recruiting veterinary students. Most importantly; those interested in veterinary education should pay attention to the critical traits of the newly admitted students such as age, high school background, frequencies of taking high school exams, high school certificate as well as admission policies. Furthermore, they should evaluate and update the veterinary curriculum until the educational outputs commensurate with the diverse, renewable and infinite needs of the veterinary labour market. Quality assurance in veterinary education has become a vital and very important issue all over the world. Unfortunately, assessing the quality of veterinary education in Sudan is entirely dependent on the traditional method, which relies only on assessing the educational programs provided by colleges. With the expansion of higher education in the Sudan at the end of the twentieth century; so called higher education revolution (HER); many veterinary faculties have been established. This situation entails admission of many students with varying capabilities and different traits to veterinary education. Therefore, it became necessary to conduct continuous, comprehensive evaluation and accreditation processes for all veterinary faculties as well as other higher education institutions in the Sudan to ensure similarity of level and quality of graduates. The evaluation should include the personal and academic traits of students to ensure the similarity of students' quality. Thus this study aims to compare the traits and quality of students enrolled in some Sudanese veterinary colleges. Furthermore the study is intended to highlight the serious catastrophic effects of admitting students of minimum academic standards on the quality of the veterinary profession in the future.

Previous studies

The percentage the student obtains in the high school exam (HSC) exams and qualifies him for admission to the faculties of veterinary medicine is detrimental to the quality of veterinarian upon graduation. The HSC performance is widely used as criteria for admission to university colleges in many countries, in the United Kingdom (Foy and Waller, 1987) and in South Africa (Swart, 1999). This is practised because the most detrimental factor for university student quality is his prior academic performance in HSC or equivalent (Staffolani and Bratti, 2002; Frischenschlager et al. 2005; Geiser and Santelices , 2007). In a study carried by

Anderson et al. (1994) he found that the most determinant of success in university colleges is the grades the student obtained in HSC. However, the academic performance prior to university (HSC) was found to has no effect on academic performance at the university and it cannot be used as academic performance predictor (Huws et al., 2006).The age of student is also known to affect the student performance in the university. Mature students are known to perform better than immature students (Richardson, 1994). Mature students are defined as those students whose age was greater than 21 years on their first day at the university. While young students are those whose age on their first day at the university is 21 years of age or less? Gender influence on academic performance has been investigated in many studies and cannot be ignored. Research has shown that men perform better than women in certain settings while women outperform better than men in other settings (Haist et al., 2000). Borde (1998), on the other hand, found no evidence of academic performance being influenced by gender. Woodfield and Earl-Novell (2006) analysed data of close to two million graduate students and found that female students outperformed male students. Students admitted to veterinary education come from different school back grounds. The school background is known to influence the student performance at the university (Ali et al. 2013; Crosne and Elder, 2004). Also admission policies are known as an important factor for success in the university (Ali et al. 2013; Mlambo, 2011). Furthermore students' selection was confirmed to influence the student performance in the university (Obeyesekere, 2004).

Methodology

Personal and academic data of 394 students from four different Sudanese faculties of veterinary medicine; namely faculty of veterinary medicine university of Khartoum, Faculty of Veterinary Medicine University of Sudan, Faculty of Veterinary Medicine University of Bahri, Faculty of Veterinary Medicine University of Butana; were collected by a questionnaire. The collected data were the age at time of admission; gender; type of high school attended; frequency of taking high school exams, qualifying percent and type of admission. The data were subjected to ANOVA or Chi $\times^2$. High school percent and age of admission are presented as means ± SE of the mean. The probability was set at $p<0.05$.

Results

Admission percentage

From table 1 and fig. 1 ANOVA and LSD test showed high significant ($p<0.001$) differences between the admission percentages of the different faculties. The mean admission percent to U of K is 82.9 ± 0.22; SUST 80.7 ± 0.42; U of BH 76.9 ± 0.56 and U of B was 72.3 ±0.51. The maximum admission percentages are 88.7; 87.0; 85; and 82 while the minimum percentages are 70; 68; 56 and 59 for U of K; SUSET; U of BH and U of B respectively.

Table (1) Multiple Comparisons (ANOVA & LSD test) results for qualifying percentages

(I) Faculty	(J) Faculty	Mean Difference (I-J)	SE	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Khartoum	Sudan	2.20686*	.57325	.000	1.0796	3.3341
	Bahari	5.92457*	.50965	.000	4.9224	6.9267
	Butana	10.61026*	.56122	.000	9.5067	11.7138
Sudan	Khartoum	-2.20686*	.57325	.000	-3.3341-	-1.0796-
	Bahari	3.71770*	.62882	.000	2.4812	4.9542
	Butana	8.40340*	.67129	.000	7.0834	9.7234
Bahari	Khartoum	-5.92457*	.50965	.000	-6.9267-	-4.9224-
	Sudan	-3.71770*	.62882	.000	-4.9542-	-2.4812-
	Butana	4.68570*	.61786	.000	3.4708	5.9006
Butana	Khartoum	-10.61026*	.56122	.000	-11.7138-	-9.5067-
	Sudan	-8.40340*	.67129	.000	-9.7234-	-7.0834-
	Bahari	-4.68570*	.61786	.000	-5.9006-	-3.4708-

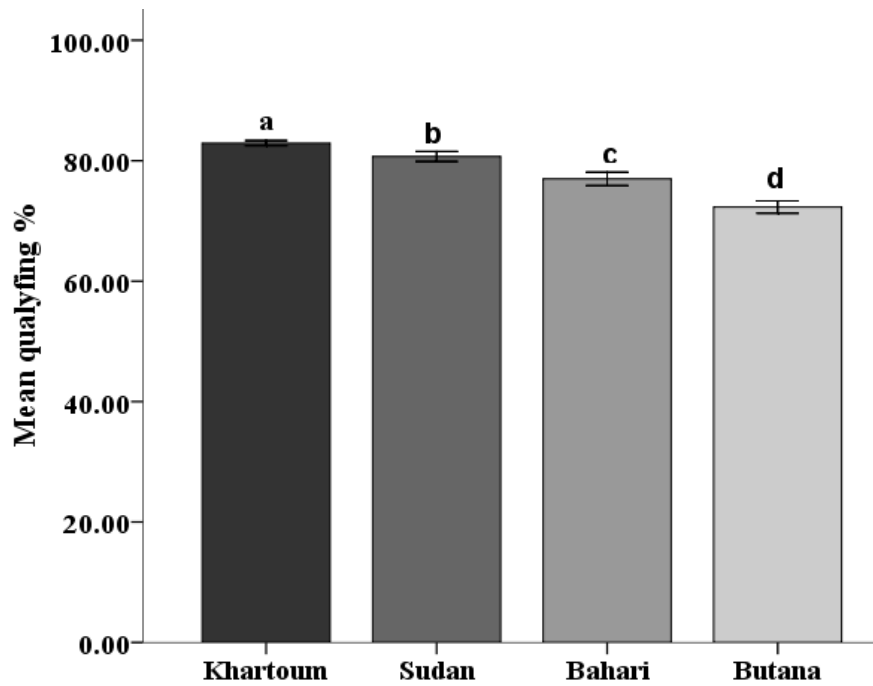*. The mean difference is significant at the 0.001 level.

Fig. (1) Means of qualifying percentages. [a, b, c, d] $p<0.001$.

Frequency of taking HSC exams

As in table 2 and fig. 2 high percentages of students enrolled in veterinary education took HSC exam more than once. The overall percentages of students

Who took the exams twice and more is 54.8%; 60%; 46.7%; 74.0% for U of K, SUST; U of BH and U of B respectively. The highest percent is that of U of B followed by SUST U; U of K and U of BH. The percentages of those who took the exam once are similarly high in U of K, SUST and U of BH.

Table (2) Frequency of taking HSC exams among surveyed faculties students

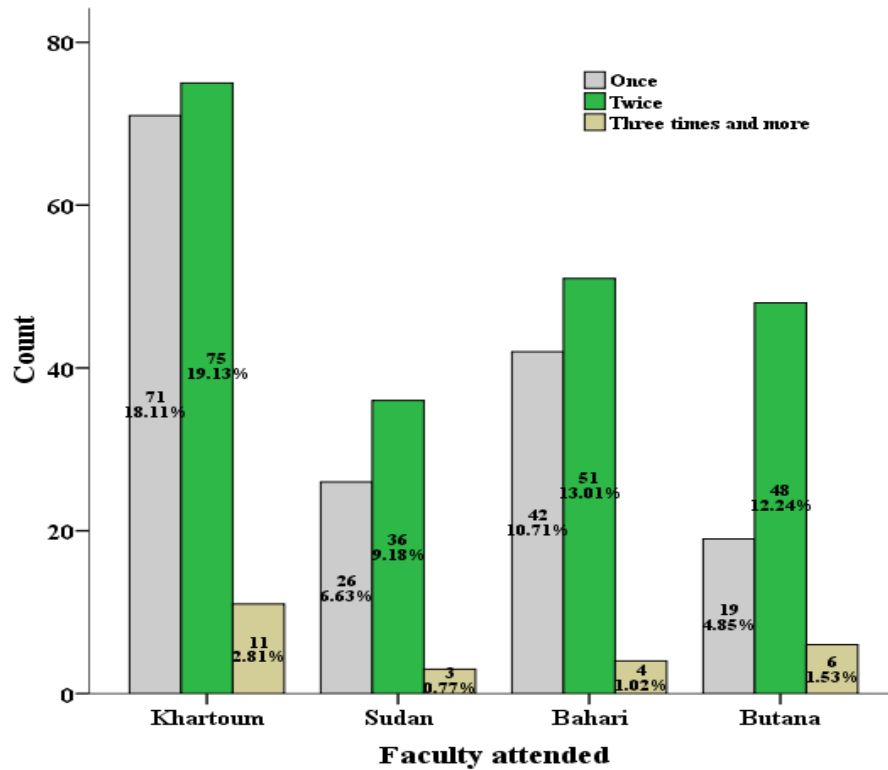| Exams frequency	Faculties of veterinary medicine				Total
	U of K	SUST	U of BH	U of B	
Once	71 (45.2%)	26 (40.0%)	42 (43.3%)	19 (26.0%)	158 (40.3%)
Twice	75 (47.8%)	36 (55.4%)	51 (52.6%)	48 (65.8%)	210 (53.6%)
≥Thrice	11 (7.0%)	3 (4.6%)	4 (4.1%)	6 (8.2%)	24 (6.1%)
Overall	157 (100%)	65 (100%)	97 (100%)	73 (100%)	392 (100%)

Fig. (2) Counts and percentages of students in each HSC exams frequency group.

Students' age at admission

As in fig. 3 the mean admission age of veterinary students varies significantly (p<0.05) with the college. The mean admission age for students enrolled in faculty of veterinary medicine U of K was 18.13 ± 0.08; Sudan University of Science and Technology (SUST) was 18.35 ± 0.25; Bahari University (U of BH) was 18.76 ± 0.14 and that of Butana University (U of B) was 20.18 ± 0.25 years. Also the admission age differs significantly (p<0.001) with gender. The mean admission age of female students was 18.76 ± 0.14 and that of male students was 19.42 ± 0.16 years. As in table (3) the percentage of boys admitted at an age of 16-19 years old is high (P<0.05) in U of K and SUST compared to other faculties. While in the faculties of veterinary medicine of U of BH and U of B the percentage of boys admitted at an age of 20 years or above is higher (p<0.01). The distribution of the different groups of ages for females is almost similar in three faculties of U of K, SUST and U of BH. The maximum admission ages were 21.6; 31.6; 22.6 and 26.6 years for U of K; SUST, U of BH and U of B, while the minimum admission ages were 16.19; 16.2; 16.16 and 15.6 respectively.
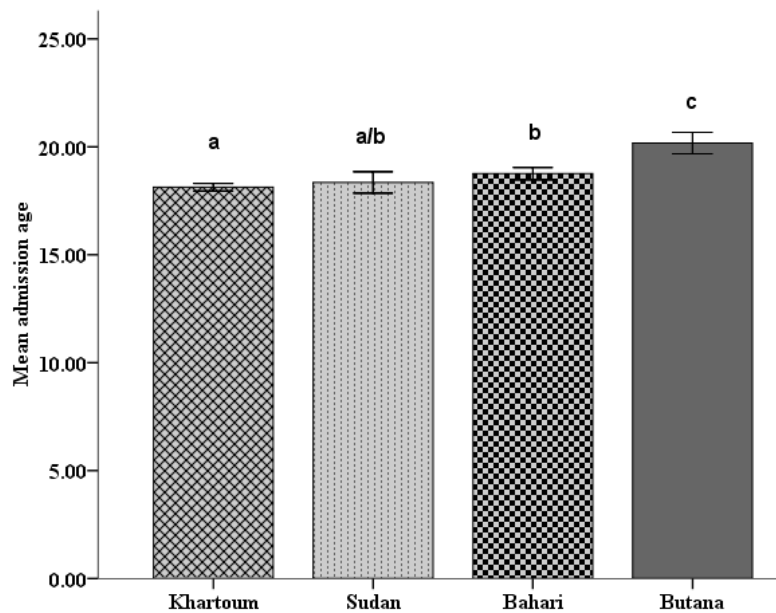
Fig. (3). The mean admission age of students in the different faculties. [a, b, c] p<0.05.

Table (3). Distribution of the surveyed students to the different age groups.

| Gender | Age group | Surveyed students (Count/%) | | | | Total |
		U of K	Sudan	Bahri	Butana	
Male	16-17	6 (14.0%) [a]	5 (17.9%) [a]	1 (2.5%)	6 (8.2%)	18 (9.8%)
	18-19	30(69.8%) [b]	16 (57.1%) [b]	17(42.5%) [b]	26(35.6%) [b]	89 (48.4%)
	≥ 20 and	7(16.3%)	7 (25.0%) [b]	22(55%) [b]	41 (56.2%) [b]	77 (41.8%)
	Total	43 (100.0%)	28 (100.0%)	40(100.0%)	73 (100.0%)	184 (100.0%)
Female	16-17	16 (14.7%)	6 (16.2%)	10 (17.2%)	0 (0.00%)	32 (15.7%)
	18-19	73 (67.0%)	28 (75.7%)	37 (63.8%)	0 (0.00%)	138 (67.6%)
	≥2 0	20 (18.3%)	3 (8.1%)	11 (19.0%)	0 (0.00%)	34 (16.7%)
	Total	109(100.0%)	37 (100.0%)	58 (100.0%)	0 (0.00%)	204 (100.0%)

* p<0.05;** p<0.01.

The proportion of male students to female students surveyed

The ratio of male students to female students differs significantly (p<0.001) with faculty. Among the students of faculty of veterinary medicine surveyed no female students (0.00%) were found in U of B. The ratio is almost similar for SUST and U of B. The highest female to male ratio (71.5:28.5) is recorded in U of K followed by university of BH (59.2: 40.8), SUST (56.9: 43.1) while among students surveyed in faculty of veterinary medicine U of B no females were observed (Table 4).

Table (2) Female to male ratio of the surveyed samples

Gender	Faculties of veterinary medicine in*				
	U of K	SUST	U of BH	U of B	Total
Male	45 (28.5%)	28 (43.1%)	40 (40.8%)	73 (100%)	186 (47.2%)
Female	113 (71.5%)	37 (56.9%)	58 (59.2%)	0 (0.0%)	208 (52.8%)
Total	158 (100%)	65(100%)	98 (100%)	73 (100%)	394 (100%)

*The proportion of male students to female students differ at $p<0.001$

Type of admission in veterinary education

Table (4) shows the different types of admission in veterinary education. The general admission represents the higher percentage. In U of K surveyed students 142 students (89.9%) were admitted under general admission, in SUST 45 students (69.3%), in U of BH 77 (78.6%) and U of B were 65 (89.0%). The remaining types of admission represent the remaining percentages.

Table (4) Counts (%) of students admitted under different types of admission

Type of admission	Faculty of veterinary medicine admitted to N(%)			
	U of K	SUST	U of BH	U of B
General	142 (89.9%)	45 (69.3%)	77 (78.6%)	65 (89.0%)
Sons of workers at HE	1 (0.6%)	1 (1.5%)	4 (4.10%)	3 (4.10%)
Private	12 (7.6%)	19 (29.2%)	15 (15.3%)	5(6.80%)
Less developed areas	3 (1.9%)	0 (0.00%)	2 (2.00%)	0 (0.0%)

Type of high school attended

From table 5 and fig. 4 it is clear that acceptance of students from less developed region is the least ($p<0.001$) in all faculties. In faculty of veterinary medicine U of K the percentages of students of the remaining 3 school backgrounds are almost similar. While in SUST and U of BH the percentages of those who come from model school are high. Percentage of students who come from a regular governmental school in U of B is the highest (57.5%).

Table (5). High school attended (number and % of students surveyed

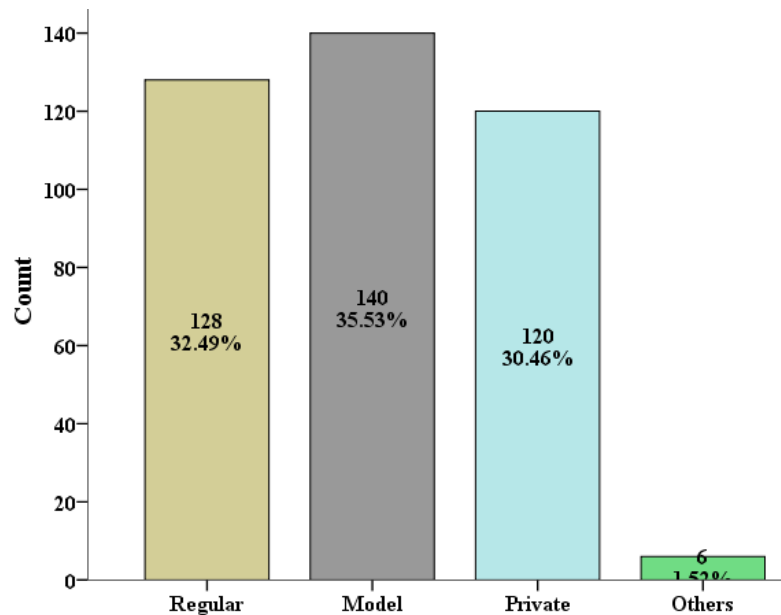| School type	Faculty of veterinary medicine				Total
	U of K	SUST	U of BH	U of B	
Regular	51(32.3%)	13(20.0%)	22(22.4%)	42(57.5%)	128
Model	55(34.8%)	32(49.2%)	44(44.9%)	9 (12.3%)	140
Private	48 (30.4%)	20 (30.8%)	31(31.6%)	21(28.8%)	120
Others	4(2.5%)	0 (0.0%)	1(1.0%)	1(1.4%)	6
Total	158 (100%)	65(100%)	98(100%)	73(100%)	394

Fig. (4) Counts and percentages of surveyed students enrolled in veterinary education from different schools background.

Discussion

Qualifying percent

This study illustrated great differences in the qualifying percentages for Sudanese faculties of veterinary medicine. Despite the fact that this finding is well known because the MHE has fixed the HSC percent that qualify students to enrol in veterinary education; the qualifying percent should be taken as a critical predictor for graduate quality. The attendees of veterinary education who are admitted with high percentages in HSC exams are expected to have a better performance in veterinary profession after graduation. The HSC performance is widely used as criteria for admission to university colleges in many countries (Foy and Waller, 1987; Swart, 1999). This is practised because the most detrimental factor for university student quality is his prior academic performance in HSC or equivalent (Anderson et al. 1994; Staffolani and Bratti, 2002; Frischenschlager et al. 2005; Geiser and Santelices , 2007). Although all these studies substantiated; by all the odds; that the better predictor for student performance in university college is his performance in HSC; some authors claimed that it cannot be used to predict academic performance at the university (Huw et al., 2006). However, Huw et al. admitted that it has small effect on university performance. In this study many students who enrol in faculties of veterinary medicine are admitted to these faculties despite the weak percentages they have achieved in the HSC exams (less than 65%). This leniency in accepting these students casts negative impacts on the veterinary profession that takes care of the large national herd, which represents a real pillar of the Sudanese economy. In addition, graduates lose the preferential competitive characteristics enjoyed by their predecessors from the mother faculty of veterinary medicine, in the local and regional labour market. Furthermore, this leniency will lead to graduation of veterinarians of different qualities.

Student admission age and frequency of taking HSC exams

This study emphasized large differences in admission ages of students who undertook veterinary education in Sudan and most of the students are accepted at an age less than 18 years old except those of faculty of veterinary medicine of Butana who are admitted at an age more than 20 years. The recent changes in Sudan educational policies and the attitude of parents towards their children led to admission of an increased number of young-age students in university colleges. A large proportion of undergraduate students are admitted at 16-17 year olds. Mature students are known to perform better than immature students (Richardson, 1994). The definition of a mature student varies with country where 21, 22 and 25 year old students being classified as mature students in the United Kingdom, United States of America and Australia, respectively (Trueman and Hartley, 1996). Mature students are defined as those students whose age was greater than 21 years on their first day at the university. While young students are those whose age on their first day at the university is 21 years of age or less? In Sudan mature students in the university are either students whose parents insist to admit them to primary school at the age of 7 years or more and/or those who repeat in primary and secondary schools and/ or those who failed more than once in HSC. Unfortunately many mature students who attain university colleges

after one or more failures in HSC are known to have some difficulties. The students who are admitted at the age more than 18years are expected to perform well. The age is very critical for gender since females can attain maturity at lesser age than males due to their physiological differences. Consequently when females and males are admitted at equal age the females are expected to outperform males. This is not due to their high IQ but it is merely a physiological difference that can be overcome by admitting males at an older age than females. Unfortunately, from the results of this study as high as 45% of students enrolled in veterinary education took the HSC exam more than twice. In particular this percent reached 60% in faculty of veterinary medicine of SUST and 74% in faculty of veterinary medicine university of Butana. This has a positive effect on students whose age is below 17 years when they took the HSC exam for the first time. However, the students enrolled in veterinary education after taking the HSC exam more than twice are expected to have a weak academic performance which is augmented by the difficulties of veterinary sciences that covers wide spectrums of animal species.

Student gender

Except the faculty of veterinary medicine university of Butana; where no female students were admitted; the remaining faculties admitted as high as 52% females. The proportion of females in the faculties of veterinary medicine continues to increase, especially in the faculty of medicine university of Khartoum, where the proportion of females amounted to more than 70%. This situation entails that in the future the female veterinary teaching staffs and veterinarians will dominate in Sudan since females can outperform male. This is attributed to fact that female students are more conscientious and physiologically mature, thus less likely to miss lectures when compared to male students (Woodfield and Earl-Novell 2006). The age and gender interactions are very crucial in determination of the academic performance at the university. Thus when females entered the university they are usually mature and are expected to perform well. Consequently the majority of veterinarians will be females. As the veterinary profession is practiced in very harsh areas of the states of Sudan; the veterinary profession needs a greater number of males than females, which cannot be avails under this situation.

Type of high school attended

From this study students of the different veterinary faculties came from different high school backgrounds. After the HER and the change in the general education policies many different types of high schools are established. Among these schools are many elite private and governmental schools (model schools) that admit students of high quality only. Students from elite schools and/or model schools are expected to perform well (Ali et al. 2013). These elite schools are usually very rich in resources and facilities. The ownership and the funds available are the most powerful factors that influence the performance of the student and consequently their future university performance (Crosnoe and et al. 2004). The elite schools (private and model governmental schools) have good funding, higher level of discipline, and are very selective when choosing students. Students from such schools tend to have higher end of school scores (Considine and Zappala, 2002). Private and model government schools that have better funding, fewer students per class, serious administration and better financial resources are expected to graduate good quality students than public schools. Consequently the faculties that admit students from such schools are expected to have good graduates. The veterinary students come from different high school background and are enrolled in veterinary education with varying HSC percentages. This situation also aggravates the condition and helps in graduating veterinarians of varying quality.

Admission policies

After HER the Sudan ministry of high education adopted different admission polices regardless of the HSC results. Thus it is very obvious from this study that many students are admitted to veterinary education with low qualifications. Student admission to university colleges and institutes is based on a number of different qualifications (Ali et al. 2013; Mlambo, 2011). Since learning is a cumulative process, thus a student recruited with higher entry requirements will be well prepared for the course material compared to a student admitted based on bare minimum qualifications. In the Sudan before the HER students are admitted to veterinary education under certain known and fixed admission requirements based mainly on HSC performance and a certain percentage achieved by the student. In the past there is a single veterinary college at university of Khartoum. But currently there are additional 5 colleges (total= 6 colleges). Consequently the admission policies adopted differ. The minimum required percentage in HSC obtained by the student enrolled in veterinary education differs. Additionally there are different categories of students' admission: general admission based on academic qualification in HSC, admission on private expenses based on the ability of the student to pay certain fees, admission of sons of workers in high education and other categories including students who have HSC from Arab countries. These different admission policies lead to graduation of veterinarians of varying quality. Under the current admission system there is no method of evaluating either student's interest in the subject or

their aptitude for it. Consequently, many students enter the faculty of veterinary medicine because of a lack of choice. Without interest and aptitude, the output will be of low quality. This system of selection tends to produce professionals who lack special interest in a career in veterinary medicine (Obeyesekere, 2004). The cost of training a veterinary graduate is much higher than that of training a graduate in a non-clinical or nonmedical field. The veterinary faculty's limited finances and resources, as well as the student's valuable time and effort, would have been more economically, efficiently, and productively spent had these students initially entered a field of their choice. In contrast, in many other countries veterinary science is a sought-after career that is competitive and difficult to enter (Obeyesekere, 2004). To become a member of the profession requires dedication and serious commitment and is considered a privilege. Therefore in some western countries students enrol in veterinary education after completing a science college.

Conclusion and recommendations

The quality of students enrolled in veterinary education in Sudan varies with faculty. Therefore the following is recommended:

There must be a defined, unified and accredited minimum percent for admission to similar veterinary colleges. This percent must be authorized by the veterinary commission; educators; labour market as well as the ministry of higher education.

When admitting students to veterinary education the student age, gender and the frequencies of taking high school exams must be taken into account as an important variable that affects the quality of future veterinarians..

The general education institutions; especially high schools; must be of a single integrated style to graduate students of similar levels.

The public and higher education policies that allow the admission of students under the legal age must be reviewed, rectified, amended and earnestly implemented.

The higher education policies that allow admission of students with low academic standard must be halted and replaced by adopting strict admission policies to ensure graduation of veterinarians of homologous quality.

References

Anderson, G.; Benjamin, D. and Fuss, M.A. 1994. The Determinants of Success in University Introductory Economics Course. The Journal of Economic Education, 25(2), 99–119.

Ali, S.; Haider, Z.; Munir, F.; Khan, H. and Ahmed, A. 2013. Factors contributing to the students' academic performance: A case study of Islamia University Sub-campus. American Journal of Educational Research, 1(8): 283-289.

Borde, S. F. 1998. Predictors of student academic performance in the introductory marketing course. Journal of Education for Business, 73(5): 302-306.

Considine, G. and. Zappala, G. 2002. The influence of social and economic disadvantage in the academic performance of school students in Australia. Journal of Sociology 38(2): 129–48.

Crosnoe, R., Johnson, M. K. and Elder Jr. G.H. 2004. School Size and the Interpersonal Side of Education: An Examination of Race/Ethnicity and Organizational Context. Social Science Quarterly, 85 (5): 1259–1274. DOI: 10.1111/j.0038-4941.2004.00275.

Foy, J. M. and Waller, D.M 1987. Using British school examinations as a predictor of university performance in pharmacy course: A correlative study. Higher Education, 16: 691-698.

Frischenschlager O., Haidinger, G. and Mitterauer, L. 2005. Factors associated with academic success at Vienna Medical School: prospective survey. Croatian Medical Journal 46(1): 58-65.

Geiser, S. and Santelices, M. V.. 2007. Validity of High-School Grades in predicting student success beyond the freshman year: High-School Record vs. standardized tests as indicators of four-year college outcomes.http://www.cshe.berkeley.edu/sites/default/files/shared/publicatios/docs/ Retrieved September 20, 2014.

Haist S. A., Wilson, J. F., Elam, C. L., Blue, A. V., Fosson, S. E. 2000. The effect of gender and age on medical school performance: An important interaction. Adv Health Sci Educ Theory Pract 5: 197–205.

Huws, N., Reddy, P., and Talcott, J. 2006. Predicting university success in psychology: Are subject-specific skills important? Available at: http://www.aston.ac.uk/downloads/ihs/peelea/huw2006p. pdf (Retrieved: September 2014).

Mlambo, V. 2011. An analysis of some factors affecting student academic performance in an introductory biochemistry course at the University of the West Indies. Caribbean Teaching Scholar 1(2): 79–92.

Obeyesekere, N. 2004. Needs, difficulties, and possible approaches to providing quality clinical veterinary education with the aim of improving standards of companion animal medicine in Sri Lanka. Journal of Veterinary Medical Education, 31 (1): 32-37.

Richardson, J.T.E. 1994. Mature students in higher education: academic performance and intellectual ability. Higher Education 28. Kluwer Academic Publishers. The Netherlands.

Staffolani, S. and Bratti, M. 2002. Student time allocation and education production functions. http://ideas.repec.org/p/wpa/wuwphe/0207001.html - 16k.

Swart, A. 1999. Evaluation of the assessment strategy for admission at Pretoria University. Retrieved September 21, 2014.

Trueman, M. and Hartley, J. 1996. A comparison between the time management skills and academic performance of mature and traditional-entry university students. Higher Education, 32, 199-215.

Woodsfield, R. and Earl-Novell, S. 2006. An assessment of the extent to which subject variation between the arts and sciences in relation to the award of a first class degree can explain the gender gap in UK Universities. British Journal of Sociology of Education, 27 (3): 355-372.