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Student Characteristics Influencing Bachelor of Science Nursing Student Performance in the Nursing Council of Kenya Licensure Examinations in Kenya

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Abstract: *Kenya has seen drastic changes in nursing education sector recording high rates of enrolment of students to training. However, their performance in Nursing Council of Kenya (NCK) examination remains variable. This study investigated performance of BSc nursing students in NCK examinations by examining student characteristics in relation to performance. The study used qualitative and quantitative approach to collect data retrospectively. 1292 records of students who sat examinations July 2012-June 2015 from NCK nurses database was used. Cluster and purposive sampling were done for key informants interviewed from nursing schools. Quantitative data was converted from MS Access to SAS and analyzed. Odds ratio was used to measure strength of association between student characteristics and performance with $p \leq 0.05$ being considered significant. Qualitative data was recorded and transcribed for content analysis. The proportion of those who passed and aged 30 years and above was significantly higher than those who were less than 30 years (OR: 1.6, 95% CI: 1.2-2.2, p= 0.002). Marital status and employment, were reported by key informants to influence performance. In conclusion the study identified age, faculty years of experience and class attendance policy were associated with performance. Marital status and employment were reported to influence performance by key informants.The study recommended training institutions to continue with upgrading Programmes, Results will be used to predict performance and facilitate review of policies for recruitment and examination.*

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I. Introduction

Following the education system in Kenya, most BScN student first attempt the nursing council examinations within the age ranges of twenty one to twenty five years. However those that have passed through other programs such as diploma first may find themselves attempting the same examinations much later in life. By understanding what makes adult learners different from traditional students, educators can provide tool that help adult learners increase their chances of success (Cari & Jason, 2011). Being older in age may lead to better GPA scores, although age does not have a significant impact on academic performance ($p>0.05$) (Valli *et al*, 2014). (Pitt *et al*, 2012) also found out in their systematic reviews found out that more studies had identified older students performing better than their younger counterparts.

Nursing all over the world is presumed to be a female dominated profesion. Female students exhibit higher cGPA scores than their male counterparts as shown by the differences between the cGPA of female students and male students, Cohen's d ($d = 1.16$) indicating a meaningful statistical difference (Valli *et al*, 2014). Other studies found out that gender could not be identified to be influencing performance in any way a thought shared by (Meece & Jones, 1996) and (Pitt *et al*, 2012) in their systematic reviews.

Nursing studies have structures that allow students into programs irrespective of their marital status. These does not seem to influence performance in the licensure examination in any way (Ngugi, 2013). The same findings are echoed by (Fullerton & Severino, 1995). Some of the characteristics of adult nontraditional students are family commitment and employment (Cari & Jason, 2011). Highest GPAs are held by students who did not work and by those who worked more than 20 hours per week showing that students are able to balance work and academics (Ibid). However, Cooper finds negative effects of working while attending college

showing a relationship with undesirable influences on academic success and health (Cooper 2012). Giving its recommendation on how to improve performance in the NCLEX examination, the taskforce mandated with investigation asked the employers to provide fulltime benefits and scholarships for staffs, encourage and assist employees prepare for examinations and also give special recognition for employees who pass examination in their institutions (Iowa board of nursing, 2006). Full time students working more than 16 hours per week exhibited poor performance in several studies that were reviewed by (Pitt *et al*, 2012) in their systematic reviews.

(Yusif *et al*, 2011) Citing (Birdsall, 1996) states that Countries with low levels of literacy have difficulties achieving high levels of growth, thus quality education is crucial to the development of any profession. Several professions such as law, medicine and nursing require candidates to pass licensing examination prior to practice (Coons, 2014). The need to produce quality, safe practitioners in the health care is supreme, especially with the increasing cost of health care. Sophisticated advances in medical sciences and technology, increasing awareness and knowledge through internet have all increased the expectations of the public for quality care and demand for their rights (Ogbonaya, 2014). This has further increased the need for quality of nurse training (Idowu, 2013). Overall quality of nursing education must continue to develop to its best so as to meet the student needs and future patient needs (Coons, 2014). Pass rates represent measure of faculty and program effectiveness, and some pass rates need to be attained in order for a program to maintain its accreditation (Silvestri, 2013). For students to succeed in any examination, it requires individual students and their circumstances within their environments and intervening throughout the process of learning (Iowa board of nursing, 2006). Nurses and other members of health professions handle human lives necessitating no room for mistakes because any error done could cost the life of a patient. This calls on them to be sensitive, caring, committed, and equipped with adequate real time skills and knowledge in performance of their roles (Oh *et al*, 2011). It demands that they should possess recognized qualification before they can be registered and practice legally in any country (Oh *et al*, 2011) and this qualification comes with a pass in their licensure examination. This demands make academic performance a priority to students as well as the teachers (Ukpong & George, 2013). In Kenya, NCK in CAP 257 of the laws of the country prescribes and conduct examinations for persons seeking registration or enrolment under the Act. A pass in examination depends on many factors and these include student factors.

Kenya has experienced drastic growth in the nursing education sector recording high proportions of enrolment of nursing students to various levels of training while the performance of the students in the NCK examination remained variable (Nyangena, 2013). The NCK examination performance 2012 shows 79.5% pass rate among BScN students with 20.5% students failing (Kenya Nursing Workforce Report, 2012).

Table 1 shows overall BScN performance of 2015 January.

Regardless of a background of selection embracing very high performance in high school, there is 0 % distinction, 0.5 % credit, 88.6 % pass with 9.4 % fail (NCK, 2015). This trend was repeated for the past three year's reports of results indicating an average of 19.82% fail, 0.00% distinctions and 0.92 % credits provoking the need to do an evaluation (NCK, 2015, 2014, and 2013) yet there is very limited data documenting the trends in the performance.

Table 1 *Table showing overall BScN performance for January 2015*

Distinction		Credit		Pass		Fail		Withdrawal	
NO	%	NO	%	NO	%	NO	%	NO	%
0	0	3	0.54	491	88.65	52	9.39	8	1.44

II. Objective Of The Study

To investigate the relationship between BScN student characteristics and their performance in the NCK examinations.

The specific objectives are

1. To explore the age of student in relation to performance in the NCK examinations
2. To assess the gender of the students in relation to performance in the NCK examinations
3. To determine the relationship between marital status and performance in the NCK examinations
4. To examine the relationship between the employment status of the student and performance in the NCK examinations

METHODOLOGY

This research was a retrospective, qualitative and quantitative study. The researcher used record review in gathering information from NCK database by analyzing of three year performance from 2012 July to 2015 June and key informant interviews to get data from institutional heads. NCK database and schools of nursing country wide formed the main study area. The study population comprised all BScN students' records of NCK

examination in the NCK database from 2012 July to 2015 June totaling to 1292 and heads of schools of nursing respectively.

The researcher started with cluster sampling where the units were categorized into three clusters; private, public and faith based followed by simple random sampling of schools. Proportionate allocation of participants into the cluster was done basing on their level of representation. For key informants, purposive sampling was done. All eligible candidates' records were included in the sample for data base analysis.

Research tool was adopted from one used by the Task Force report from the nursing education institutions and faculty (RENRE, 2014). Institutions offering BScN education and had enrolled their students for NCK examinations during the reference period were included in the study and those presenting their students for NCK examinations at least twice a year. Students on upgrading face to face and direct entry were also included while distant and e learning were excluded. All student data for 2012 July to 2015 June were in the sample and the rest excluded.

Data analysis was done using a customized Excel and the SAS software. To provide a profile of students, frequencies, means, range and standard deviations for data was done Bivariate analysis of dependent and independent variables was also done with p [less than or equal to] .05, being considered significant. To determine relationship between selected variables and performance in NCK examination regression analysis was used because the dependent variable was dichotomous. Content analysis was done for qualitative data.

The researcher sought approval to conduct the study from Masinde Muliro university school of graduate studies, and permit from NACOSTI. The researcher also sought permission from the NCK to utilize their data and informed consent from participants.

III. Results

General findings

The total number of students who sat the NCK examination for the period July 2012 to June 2015 was 1292 while for the two complete years 2013-2014 was 790. The highest number of students who sat for examination was recorded in the year 2014 which was 470 (36.4%) students. There was a higher number of students sitting examinations in 2014 compared with the previous year 2013 which was 320 (24.7%). For 2012 which had 97 (7.6%) students and 2015 that had 405 (31.3%) data was only captured for half a year.

Figure 1.illustrates that, during the 2012 period UEAB recorded the highest proportion of students being 39 (40.2%) for that year then experienced a drop in 2013 but proportion went up again in 2014. GLUK on the other hand started on slightly higher note although lower than KEMU and UEAB, but then experienced a drop throughout the rest of the period. KU had a drop in the year 2013 but went up again in 2014. MMUST experience an increase throughout the period while MOI and UON increased their proportion of enrolment in 2013 and dropped in 2014.

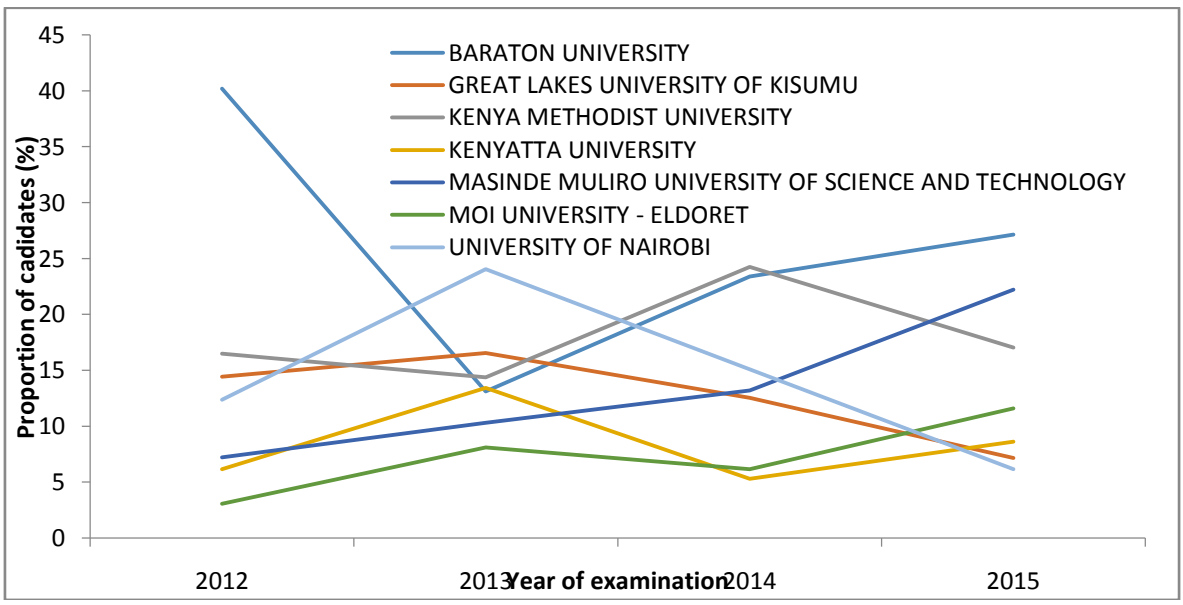

Figure 1. Graph showing Year of Examination by institution

Demographic characteristics of students

Results on age group comparison shows that Majority of the students were between ages of 20-29 years old and that was 667 (51.6%) followed by ages of 30 to 39 years being 390 (30.2%) while the least were those

above 50 years 55 (4.3%) of the total students that sat for the nursing council examinations during the reference period. UON had the highest population of students 173 out of 185 (93.5%) being ages 20 – 29 years while the least was GLUK having only 17 out of 155 (11%) of the students being age 20 – 29 years old. KEMU had the highest population of the older students who were above 50 years being 20 out of 55 (8.2%) of the total population although some universities such as KU and UON had none of their students in that age bracket. The mean age of the students was 32.3 ± 8.2 (20.9 – 58.8). GLUK had the highest mean age of 36.8 ± 7.0 (23.2 – 57.5) years, while UON had the lowest mean of 27.0±2.9 (20.9 – 46.7).

Out of the total 1292, 945 (73.1%) who sat for the NCK examination during the period July 2012 to June 2015 were female while 347 (26.9%) were males. Across all the universities, the proportion of females exceeded the that of males with UEAB leading with 249 out of 301 (82. %) of the students being females and only 52 (17.3%) males, while Kenyatta University had the least with 67 out of 109 (61.5%) females and 42 (38.5%) males.

The table 1. below illustrates the demographic characteristics

Variable	Categories	UEAB (%)	GLUK (%)	KEMU (%)	KU (%)	MMUST (%)	Moi (%)	UoN (%)	Total (%)
Gender	Male	52 (17.3)	40 (25.8)	48 (19.6)	42 (38.5)	64 (33.3)	32 (30.5)	69 (37.3)	347 (26.9)
	Female	249 (82.7)	115 (74.2)	197 (80.4)	67 (61.5)	128 (66.7)	73 (69.5)	116 (62.7)	945 (73.1)
	Total	**301**	**155**	**245**	**109**	**192**	**105**	**185**	**1292**
Age group in years	20 – 29	128 (42.5)	17 (11.0)	74 (30.2)	94 (86.3)	92 (47.9)	89 (84.8)	173 (93.5)	667 (51.6)
	30 – 39	110 (36.5)	95 (61.3)	95 (38.8)	14 (12.8)	54 (28.2)	12 (11.4)	10 (5.4)	390 (30.2)
	40 – 49	50 (16.6)	35 (22.6)	56 (22.9)	1 (0.9)	35 (18.2)	1 (1.0)	2 (0.9)	180 (13.9)
	>=50	13 (4.3)	8 (5.2)	20 (8.2)	0 (0.0)	11 (5.7)	3 (2.9)	0 (0.0)	55 (4.3)
	Total	**301**	**155**	**245**	**109**	**192**	**105**	**185**	**1292**
Mean age in years	Mean± SD (Range)	33.4±8.3 (22.4 – 57.9)	36.8±7.0 (23.2 – 57.5)	36.0±8.5 (23.0 – 57.4)	27.0±3.6 (21.3 – 47.2)	32.8±9.2 (21.5 – 58.8)	27.4±5.6 (21.8 – 53.1)	27.0±2.9 (20.9 – 46.7)	32.3±8.2 (20.9 – 58.8)

Table 1. Socio-demographic characteristics of BScN students (July 2010-June 2015)

Overall performance basing on age and gender (July 2012-June 2015)

The overall percentage pass in all the institutions was 1087 out of 1292 (84.1%). However the highest percentage pass was recorded in age group 30-39and was (89.5) and the lowest in age group 20-29 (81.1%). Gender results showed that males performed marginally better than their female counterparts by having 84.2% pass against females with 84.1% (see table 2 below).

Table 2. Overall Performance in relation to age and gender (July 2012-June 2015)

Variable	**Categories**	**Pass (%)**	**Fail (%)**
Age group in years	20 – 29	541 (81.1)	126 (18.9)
	30 – 39	349 (89.5)	41 (10.5)
	40 – 49	152 (84.4)	28 (15.6)
	>=50	45 (81.8)	10 (18.2)
	Total	1087 (84.1)	205 (15.9)
Gender	Male	292 (84.2)	55 (15.8)
	Female	795 (84.1)	15 (15.9)
	Total	1087 (84.1)	205 (15.9)

4.2.1 Age and performance

The highest performance was in the ages of 30-39 which was 349 out of 390 accounting to 89.5% while the lowest was ages 20 -29 which was 541 out of 667 (81.1%). KU had the highest pass among the ages 20-29 years with 85 out of 94 students passing (90.4%) compared to GLUK that had the lowest in the same category with 12 out of 17 passing (70.6%). For ages 30-39 years MOI had all its 12(100%) students passing followed by KEMU with 86 out of 95 (90.5%) and among the ages 40-49 years, KU, MOI and UON which all had two and below students recorded 100% pass followed by GLUK with 35 students in the same group having

88.6 % pass. MMUST had all the students 11(100%) in the age group of 50 and above passing followed by KEMU which had 20 students and recorded a 90.5% pass whereas UEAB performed poorest in the category with only 8 out of 13 students passing (61.5%).

4.2.2 Gender and performance

Averagely 292 (84.2%) males passed the national licensure examination for the period under study with only 55 (15.85%) failing compared to the females 795 (84.1 %) passed. The highest percentage pass for males was from KU with 37 out of 42 candidates (88.10 %) followed by MMUST with 56 out of 64 candidates (87.5%) and this was lower than the females which was 61 out of 67 (91.0%) for KU followed by MMUST with111 out of 128 (86.7%). The lowest performance was among the female students, UON which recorded the lowest percentage pass of 86 out of 116 (74.1 %). Table 3 below illustrates Performance by institution in relation to age and gender

Table 3. Performance by institution in relation to age and gender (July 2012-June 2015)

Variable	Categories	UEAB		GLUK		KEMU		KU		MMUST		MOI		UON		Total	
		Pass (%)	Fail (%)	Pass (%)	Fail (%)	Pass (%)	Fail (%)	Pass (%)	Fail (%)	Pass (%)	Fail (%)	Pass (%)	Fail (%)	Pass (%)	Fail (%)	Pass (%)	Fail (%)
Age group in years	20 – 29	104 81.3	24 18.7	12 70.6	5 29.4	57 77.1	17 22.9	85 90.4	9 9.6	77 83.7	15 16.3	73 82.1	16 17.9	133 76.9	40 23.1	541 81.1	126 18.9
	30 – 39	98 89.1	12 10.9	81 85.3	14 14.7	86 90.5	9 9.5	12 85.7	2 14.3	51 94.4	3 5.6	12 100.0	0 0.0	9 90.0	1 10.0	349 89.5	41 10.5
	40 – 49	41 82.0	9 18.0	31 88.6	4 11.4	48 85.7	8 14.3	1 100.0	0 0.0	28 80.0	7 20.0	1 100.0	0 0.0	2 100.0	0 0.00	152 84.4	28 15.6
	>=50	8 61.5	5 38.5	6 75.0	2 25.0	18 90.0	2 10.0	0 0.0	0 0.0	11 100.0	0 0.0	2 66.7	1 33.3	0 0.00	0 0.00	45 81.8	10 18.2
	Total	251	50	130	25	209	36	98	11	167	25	88	17	144	41	1087	205
Gender	Male	42 80.8	10 19.2	32 80.0	8 20.0	41 85.4	7 14.6	37 88.1	5 11.9	56 87.5	8 12.5	26 81.3	6 18.7	58 84.1	11 15.9	292 84.2	55 15.8
	Female	209 83.9	40 16.1	98 85.2	17 14.8	168 85.3	29 14.7	61 91.0	6 9.0	111 86.7	17 13.3	62 84.9	11 15.1	86 74.1	30 25.9	795 84.1	150 15.9
	Total	251 83.4	50 16.6	130 83.9	25 16.1	209 85.3	36 14.7	98 89.9	11 10.1	167 87.0	25 13.0	88 83.8	17 16.2	144 77.8	41 22.2	1087 84.1	205 15.9

Table 4. Below demonstrates bivariate analysis of age and gender and performance. There was a significant association between age group and performance. The proportion of those who passed and were aged 30 years and above was significantly higher than those who were aged less than 30 years. (OR: 1.6, 95% CI: 1.2-2.2, p= 0.002). This implies that those who were older were more than one and a half times more likely to have passed compared to those who were younger. Further analysis on gender and performance did not show any significant association.

Table 4. Bivariate analysis of socio-demographic characteristics and performance (July 2012-June 2015)

Independent variable	% Pass (n=1087)	% Fail (n=205)	OR	95% CI	P value
Gender					
Male	84.2	15.9	1.0	0.7 – 1.4	0.99
Female	84.1	15.9			
Age group in years					
>= 30	87.4	12.6	1.6	1.2 – 2.2	**0.0021**
< 30	81.1	18.9			

Marital status and performance

The total number of key informants from the schools of nursing interviewed were six. Marital status was reported to influence the performance in this study with 4 out of 6 (66.7 %) participants in the key

informant interview reporting that married student performed better in examination and only 2 (33.3%) reporting contrary. One participant commenting on marital status stated

> "*These are men and women holding family responsibilities and on rare occasions do the parents take care of their needs while in school. They owe responsibility to several people. How can you imagine with all these one can play around with their studies? In fact most emerge the best in performance and almost always."*

Comparing with the bivariate analysis for age and performance, it was assumed that the majority of the candidates thirty years and above were married and this was the category that exhibited the best performance in regards to age (OR: 1.6, 95% CI: 1.2-2.2, p= 0.002).

Employment and performance

Four out of six (66.7 %) of the respondents felt that employment contributed to better performance and therefore the students who were employed were likely to perform better than those who were not. The above response were corroborated with the finding on analysis of information regarding age from the data base. This was because majority of the student within the age bracket 20-29 years performed poorly yet it was the common age attributed to non-employment grounding on the assumption that most students exit the university between ages 23 to 26 years. Majority of the participants agreed that employment affects the way student perform together with their study habits. One participant reported that

> "*Employment institutions provide tougher conditions for their staff even when it involves going to school. They are ever confronted with targets until they are used to setting their targets and striving to achieve them. Passing the nursing council examination to them is like any other achievement requiring to be met and therefore targets are set by individual leaners to ensure they pass"* said the participant.

IV. Discussions

The results found that proportion of those who passed and were aged 30 years and above was significantly higher than those who were aged less than 30 years.(OR: 1.6, 95% CI: 1.2-2.2, p = 0.002). This could be attributed to the fact that the students in that age group were likely upgraders who have had previous exposure to the same kind of examination before.

This study supports the finding of (Valli *et al*, 2014). That indicated older students performed better than the pre-service students. (Pitt *et al*, 2012) also found out that in the systematic reviews found out that more studies had identified older students performing better than their younger counterparts. Also reporting the same was (Amankwaa *et al*, 2015) who did not find any association between age, gender, and academic performance of the students.

Gender on the other hand did not have a significant relationship with performance in the nursing council examinations a finding also revealed by (Pitt, *et al* 2012) and (Borde 1998). However, (Valli *et al*, 2014) revealed a relationship contrary to this study with females performing better than males. The same findings were echoed by (Khani *et al* 2012) and Tailor (2012, citing Has *et al*, 2004) that reported females performing better than their male counterparts. Marital status and employment both had 66.7% of the key informant respondents reporting its perceived influence to performance.

However studies by (Ngugi, 2013) and (Fullerton & Severino, 1995) had earlier reported no influence of marital status to performance. This perception of married students performing better in the NCK examinations specifically could be related to the fact that most of them may belong to the age group 30 years and above and as a result have had similar exposures to the same kind of exams. This same explanation provided for marital status apply to employment status although several studies supported the negative influence of employment on performance (Cari & Jason, 2011). (Cooper, 2012), (Iowa board of nursing, 2006) and (Pitt *et al*, 2012)

V. Conclusions And Recommendations

Age had a significant relationship with performance this was because majority of the students aged 30 years and above performed better than their younger counterparts.

Marital status and employment were also reported to have an influence on whether a student passed their licensure examinations or not

Recommendations

1. Nursing council should consider updating the data base to cover all variables captured from student and institutions of nursing. This includes marital status, employment status and agency, time of exit from nursing schools among others.
2. Schools of nursing to continue with upgrading Programmes.

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