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Challenges of Nurse Tutor Utilization of the Teaching Aids

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Abstract

Introduction: Nursing is the largest healthcare profession in Malawi with more than 11,000 registered nurses (RNs), nurse technicians and midwives (NTM) practicing in hospitals and other settings like nursing colleges nationwide. Student preparation is mostly done by nursing tutors in all the nursing colleges using numerous types of teaching aids. Methods: Descriptive exploratory design which utilized both qualitative and sequential quantitative methods was applied to Iterated Purposive Probability Sampling (IPPS) of 10 nursing colleges in Malawi. This was done to 129 students and 82 nurse tutors in two structured questionnaires, 40 nurse tutors in-depth interviews and 10 students focus groups. There were 32 variables for the teaching aids under five ranked Likert scale and the Cronbach's Alpha was found to be 0.932 without standardisation and it was 0.952 after standard-disation. Results: Although nurse tutors show that they use manikins to teach ($0.011 < p = 0.05$), students seem not to agree on the utilization of the manikins during teaching both in class and at the clinical area ($0.05; p = 0.05$). There is also increased discrepancy between students and nurse tutors on internet utilization as the teaching aid as the Beta Coefficient value was ($B = 0.202$) for the nurse tutors and ($B = 1.061$) for the students basing on their experience. Use of patient as a teaching aid is very common in Malawi and both the nurse tutors and students agree that it is the realistic and best way in teaching and has a strong binary logistic regression with a model outcome of ($OR = 1.431$; 95%CI (0.890 ± 2.304); $p = 0.139$). Conclusion: There is a need to develop the teaching strategies that would be conducive with the current scarcity of the teaching aids. Use of patients if ethically followed remains the most effective and efficient teaching aid in developing countries.

Keywords

Teaching Aids, Nurse Tutor Work Experience, Student Study Experience

1. Introduction

Nursing is the largest healthcare profession in Malawi with more than 11,000 registered nurses (RNs) and nurse technicians and midwives (NTM) practicing in hospitals and other settings nationwide [1]. By 2020, Ministry of Labor Statistics projects that more than 20,000 additional nurses will be needed to work in acute care hospitals, long-term care facilities, community health centers, nursing schools, and other areas [2]. This implies that despite this number, many more qualified nurses must be prepared in programs offered by nurse tutors in nursing colleges to meet the nation's growing demand for healthcare in Malawi.

To fulfill Malawi shared goal in the preparation of a robust nursing workforce, there is a need to acknowledge the nation's full support of academic progression for nursing students in all nursing colleges. Nursing tutors are aligned with the nation's nursing council and association leaders in the belief that every nursing student and qualified nurses deserve the opportunity to pursue qualitative academic career growth and development. This student preparation is mostly done by nursing tutors in all the nursing colleges using numerous types of teaching aids [3]. This suggests nursing tutors have a big challenge to produce competent graduates from nursing students in colleges using effective quality and functional teaching aids. Therefore, the main aim of this paper is to explore the challenges of the teaching aids utilisation among nurse tutors in Malawi nursing colleges.

Nursing education in Malawi dates back from the colonial era where the European Christians through Sisters opened nursing schools in the country and used patients as teaching aids. All the Nursing Colleges that were under the Faith based organization grouped together for proper management of their hospitals and health related colleges. By 1980 the organization was called the Christian Health Association of Malawi (CHAM) and currently a part from numerous hospitals has at least 12 functioning nursing colleges [4]. The teaching resources from these colleges come from government funding and other international donations. There are only 5 government funded colleges and there is only one private nursing college. However, for more than 30 years now, Government of Malawi supports missionaries in running CHAM nursing colleges. But due to limited funding and resources, some nursing colleges have been closed at times which cause tutors and students to be fragmented in their learning process due to luck of basic teaching needs. In these colleges they produce diploma technical nurses who are capable of performing independently at primary health care level in the health system of the country. This means that they are given the responsibility to manage independently teaching resources and clinical services in the health centres across the country.

Although 85% of the CHAM nursing schools were still open by July 2013, there is critical shortage of basic student learning needs that cause nurse tutors to resign and look for greener pastures elsewhere, particularly in the United Kingdom [5]. Even those nurse tutors that still remain in the system of nursing education in Malawi find it hard to teach effectively or use modern methods of teaching strategies due to too many students, limited internet, and insufficient teaching aids. In response to this situation, government of Malawi doubled nursing student college intake. But there has been a limited response on human and material resource improvement of nurse tutors in the nursing colleges for them to function effectively [6]. This means that quality of nursing education is compromised in Malawi. This does not necessarily occur as a result of nature of curriculum but a reduced number of nurse tutors who are overstretched to cover many modules and courses within a given time. Although some nursing schools were operating while others were closed due to shortage of staff, quality of teaching was highly compromised [7]. As a remedy nurses council allowed clinical instructors with two weeks training on teaching strategies to take some modules and courses and teach in classes. This action only compromised the teaching standards in the colleges. Therefore, the main objective of this paper is to articulate the challenges of the nurse tutor in the utilization of the teaching aids. This paper is significantly making nurse tutors to be consciously aware on the need to properly use the available teaching aids in the colleges.

2. Methodology

The study design for this research is descriptive exploratory and utilized both qualitative and sequential quantitative methods. This study was conducted in Malawi from eight CHAM nursing colleges. There are about 2072 students in all the eight nursing colleges. And by 2014 there were 158 tutors in all the 8 CHAM nursing colleges and 2075 students in these colleges. Iterated purposive, Sampling (IPPS) has been chosen as the recommended sampling frame for nurse tutor teaching strategy needs. In order to achieve a sample worthy generalization quantitatively, the sample were obtained from the colleges basing on approximated (random probability) number of tutors and students respectively. Drawing sample from the population was done until the desired sample will

be achieved and it will use the following sample proportion formula: Sample Size $= n/\left[1+\left(n/\text{population}\right)\right]$ *but* $n = Z^2 P\left(1-P\right)/E^2$ (*Lemeshow*, *Hosmer*, *Klar & Lwanga*, 1990). Where *n* is sample size of tutors and students in colleges, *P* is the proportion of number of tutors or students and *E* is the margin error. This formula allowed 5% for expected margin of error (*E*) with 95% confidence level as the denominator. Z^2 is a constant score with a value of 1.96^2 (at 95% confidence level and 5% precision) [8]. So, using the same formula of probability sampling described above, it means that 129 students and 82 nurse tutors iterated randomly selected participated in the questionnaires. The questionnaire had a five ranked Likert scale with 17 items under the teaching aids. Moreover, qualitatively, 42 nurse tutors, four from each college, were purposively selected for in-depth interviews. The main variables included use of poster, figurative model, manual/modules, internet, video conference, workbook, library and patients.

It has to be added that 10 students in one focus group discussion for each nursing college also participated qualitatively.

Only those tutors that had undergone teaching methodology training, participated for the two questionnaires for the nurse tutor and the students. Only those students that have been in class for more than one year as their study experience participated in the study. All tutors who were just recruited and those on transfer and others like foreign expatriates were not included on the basis of lacking contextual experience of teaching strategy needs in Malawi.

The collected quantitative data were analyzed on SPSS software version 21.0 and the qualitative data was stored in ATLAS-ti 7.0. The data sheets were locked in drawers and the data in computers were protected by passwords only known to the researcher. Descriptive and inferential statistics in the form of frequencies, bivariate analysis and binary logistic regression were computed for tutors' teaching aids against the predictor variables of nurse tutor work experience and student study experience in different nursing colleges.

There are five ways on how this study controlled confounding variables. The most important method that were used are randomization, restriction, matching, stratification and inferential analysis. This study had an approval from ethical review boards from, University of Western Cape (UWC) and from University of Malawi (UNIMA) through COMREC. All nursing tutors' and students' participants were assured that no form of human rights violations would be encountered in the due course of the nationwide nursing tutor teaching aids assessment following the 1964 Declaration of Helsinki, the1978 Belmont Report [9]; Baltimore Treaty on Ethical Codes (BTEC) and the Nuremburg Codes in medical education research.

3. Results

3.1. Distribution of Nurse Tutors and Students on Use of Teaching Aids

The response rate on the results from the two questionnaires were 91% for students and 88% for nurse tutors. The Cronbach alpha was 0.912 standardised for nurse tutor Likert scale items and 0.941 for the student Likert scale items.

In **Figure 1**, the use of teaching aids particularly use of posters was spread into a linear graph. It was clearly noted that most of the nurse tutors from St Johns Nursing College strongly agreed on the use of posters in the last semester during teaching. But Mulanje Nursing College was the highest among those who strongly disagreed on the use of posters as a teaching aids. St. Joseph Nursing College was the least in the use of the posters as a teaching strategy when teaching during the last semester in class. Most of the nurse tutors pointed out that the main challenge is how to get the best poster on time during class as posters tend to be expensive.

However, in all colleges when Spearman correlation co-efficient was used in a two tailed test of significance analysis, use of posters by nurse tutors was found to be not correlated to the type of nursing college as the p-value was $0.023 < p = 0.05$. This means that use of posters by nurse tutors depends on the type of the college where the nurse tutor is teaching in Malawi nursing colleges.

It has also to be noted that use of overhead projector is still very high in most of the nursing colleges in Malawi as students from all colleges strongly agreed that their nursing tutors use overhead projector during teaching. Even using Spearman correlation co-efficient in a two tailed test of significance analysis, it was found out that use of overhead projector is strongly correlated to the type of the nursing college, that the nurse tutor is teaching, as the p-value was $0.002 < p = 0.05$. This also entails that the use of overhead projector is very common in all nursing colleges in Malawi. Students pointed out that poor electrical power always cause the teaching aid not to work effectively during class.
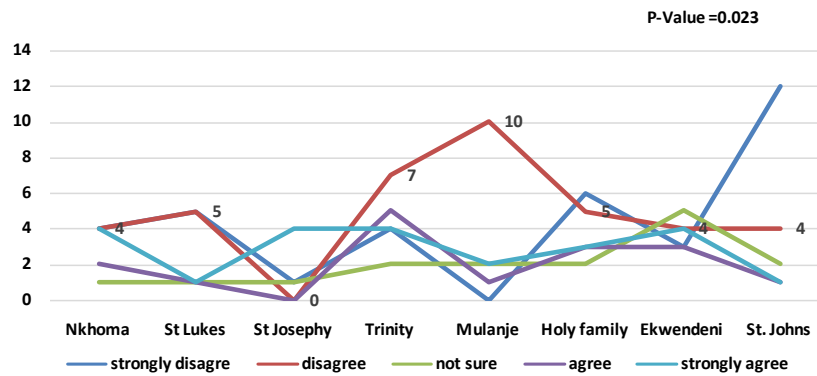
Figure 1. Distribution of tutors on the use of POSTERS in different college.

Furthermore, the use of LCD-power point presentation was compared with the type of the nursing college in a two tailed test of significance for Spearman correlation co-efficient, at 0.05 alpha level. Therefore, the null hypothesis that use of LCD was not correlated to type of nursing college was not rejected. Therefore, it was noted that student nurses strongly agreed that LCD is commonly used in their colleges during the last semester.

There was mixed feelings on the use of figurative models in different colleges in Malawi as students from Nkhoma Nursing College, Trinity Nursing College and Holy Family Nursing College strongly disagreed that their tutors used the models during clinical teaching in the last semester. However, when the Spearman correlation co-efficient was used to compare the use of the models and the type of the college for all the nursing colleges, there was no correlation as the p-value was $0.011 < p = 0.05$. This also suggest that although some colleges do not use the figurative models during teaching but generally in all colleges they models are used as statistically proven. Therefore, type of the college influence the utilization of the figurative models as teaching aid. Nurse tutors agreed that limited number and operation of the figurative model remain a challenge in their laboratories.

Although, students in all colleges indicated that they has computer laboratory, but there was mixed feeling towards the use of these computer laboratories due to poor maintenance of the old computers. Nkhoma Nursing College and Holy Family Nursing College are among the colleges where some students strongly disagreed that they use the computer laboratory. But when a two sided test of significance in bivariate analysis was used to compare the dependent variable use of computer and independent variable type of college in a Spearman correlation co-efficient, it was found out that use of computer is not correlated to type of nursing college as the p-value was $0.035 < p = 0.05$. This means that use of computer is not generally available in some colleges during the last semester although some nurse tutors complained that there is poor maintenance to the old computers that are available.

It has to be mentioned that use of internet is still a problem in some colleges of nursing in Malawi as nursing students had also mixed feelings towards the services. Trinity Nursing College, Holy Family Nursing College and St. Johns Nursing Colleges students strongly disagreed that they have used the services during the last semester both in class and at the clinical area. The main reason given was poor signal and limited distance coverage. However, most of the colleges' students also agreed that they have at times used the internet as a teaching aids during last semester. Moreover, when Spearman correlation co-efficient was used in a two tailed test of significance bivariate analysis, it was noted that use of internet was correlated with independent variable, the type of nursing college where students are learning as the p-value was $0.001 < p = 0.05$. This means that use of internet for students depends on the type of the nursing colleges that the student is learning.

In **Figure 2**, it was also noted that St. Johns Nursing College, Holy family nursing college and Trinity Nursing Colleges had the services of internet for their students as they strongly agreed on the use, although there was very slow signal both in class and at the clinical area.

The students had also a mixed feeling on the use of library as a teaching aid during teaching. All Nursing students from Nkhoma Nursing College strongly disagreed that they had used the library as a learning aid. While students from St. Lukes nursing College and St Joseph also disagreed that they use library often as a learning aid. However, when Spearman correlation co-efficient was done in a bivariate analysis with a two tailed test of significance, the null hypothesis that use of library is not correlated to type of nursing college was rejected as the
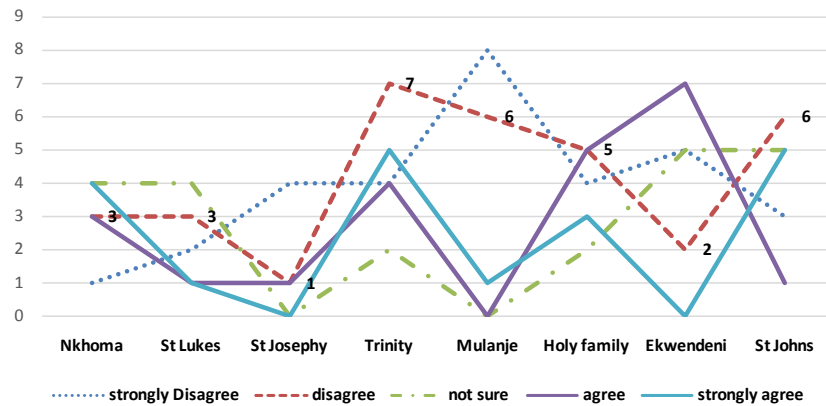
Figure 2. Distribution of use of internet by students in different colleges.

p-value was $0.003 < p = 0.05$. This means that although some colleges do not use the library so often, but use of library is correlated to the type of the nursing college.

3.2. Distribution of Nurse Tutors Work Experience and Student Study Experience on Teaching Aids Utilization

When the nurse tutor work experience was compared with the teaching aids like use of poster in a bivariate analysis, It was noted that the p-value from Spearman correlation co-efficient was $0.046 < p = 0.05$. This means that use of poster is correlated to tutors work experience during teaching both in class and at the clinical area. This is a true reflection of the tutor's perception as it was also noted that 63.2% of the tutors strong agree that they had used poster during teaching as a teaching aid during the last semester. However, this is different from student perspective as the p-value was not statistically significant at $0.101 > p = 0.05$, thus when independent variable student study experience was compared with the use of the poster. This means that although use of poster depends on tutor work experience but the same use of poster does not depend on student study experience. This discrepancy lives much to be desired in teaching and learning process in Malawi nursing colleges (see **Table 1**).

It has also to be pointed out that use of manual or module was found to be highly correlated to the nurse tutors work experience. This was because the independent variable nurse tutor work experience is correlated to dependent variable use of module as the p-value was $0.040 < p = 0.05$. This means that the Spearman correlation co-efficient favoured the alternative hypothesis that independent variable nurse tutor work experience is strongly correlated to dependent variable use of modules when teaching both in class and at the clinical area. But this was not the case with students as the p-value when we compared use of teaching module and student study experience was $0.887 > p = 0.05$. This means that we fail to reject the null hypothesis that use of teaching modules is not correlated to student study experience. This means that use of teaching module does not depend on student study experience.

There was a board-line correlation between nurse tutors work experience and the use of internet as the p-value in the Spearman correlation co-efficient was $0.05 = p\ 0.05$. This indicated that use of internet in nursing colleges depends on the work experience of the nurse tutors. This is a true reflection as the frequency statistics also revealed that 57.1% of more than 6 years nurse tutor experienced, strongly agreed that they had used the internet during the last semester both in class and at the clinical area during teaching. However, 70.8% of the students who have more than two year study experienced strongly disagreed on the use of the internet as a teaching aid in their colleges. Even the Spearman correlation co-efficient revealed that there is no statistical significant (p-value; $0.085 > p = 0.05$) between student study experience and the use of internet in nursing colleges. This indicated that students do not highly use internet as a source of learning in Malawi.

67.7% of the more experience nurse tutors indicated that they strongly disagree on the use of video conference as a teaching aid both in class and at the clinical area. It was also found out that there was no statistical significance between use of video conference and nurse tutors work experience as the p-value was $0.197 > p = 0.05$. This means that use of video conference does not depend on the nurse tutors experience. 70.3% of the students with more than two years student study experienced strongly disagreed that they had not used the video confer-

Table 1. Distribution of tutors' work experience & students study experience on and tutors' choice of teaching aids.

Choice of teaching aids variables	Work experience				Total	p-value	Students study experience N = 129				Total	p-value
	1 - 5 years		6 and more yrs		n (%)		Two year		More than two yrs		N (%)	
Use of posters							N	%	N	%		
Strongly disagree	1	12.5%	7	87.5%	8 (100)		7	30.4%	16	69.6%	23	
Disagree	7	77.8%	2	22.2%	9 (100)	0.046	6	37.5%	10	62.5%	16	0.347
Not sure	2	66.7%	1	33.3%	3 (100)		10	62.5%	6	37.5%	16	
Agree	10	37.0%	17	63.0%	27 (100)		14	35.9%	25	64.1%	39	
Strongly agree	12	34.3%	23	65.7%	35 (100)		17	48.6%	18	51.4%	35	
Use of figurative models from clinical laboratory												
Strongly disagree	0	.0%	7	100.0%	7 (100)		3	16.7%	15	83.3%	18	
Disagree	7	77.8%	2	22.2%	9 (100)	0.009	5	55.6%	4	44.4%	9	0.101
Not sure	2	25.0%	6	75.0%	8 (100)		10	52.6%	9	47.4%	19	
Agree	9	45.0%	11	55.0%	20 (100)		14	35.9%	25	64.1%	39	
Strongly agree	14	36.8%	24	63.2%	38 (100)		22	50.0%	22	50.0%	44	
Use of manual or module guides						0.040						
Strongly disagree	2	28.6%	5	71.4%	7 (100)		1	11.1%	8	88.9%	9	
Disagree	2	22.2%	7	77.8%	9 (100)		6	54.5%	5	45.5%	11	0.887
Not sure	3	60.0%	2	40.0%	5 (100)		11	52.4%	10	47.6%	21	
Agree	13	54.2%	11	45.8%	24 (100)		22	37.9%	36	62.1%	58	
Strongly agree	12	32.4%	25	67.6%	37 (100)		14	46.7%	16	53.3%	30	
Use of internet when teaching												
Strongly disagree	6	33.3%	12	66.7%	18 (100)		7	29.2%	17	70.8%	24	
Disagree	8	40.0%	12	60.0%	20 (100)	−0.050	9	34.6%	17	65.4%	26	0.085
Not sure	4	44.4%	5	55.6%	9 (100)		11	47.8%	12	52.2%	23	
Agree	8	38.1%	13	61.9%	21 (100)		14	46.7%	16	53.3%	30	
Strongly agree	6	42.9%	8	57.1%	14 (100)		13	50.0%	13	50.0%	26	
Use of video conference						0.197						
Strongly disagree	10	32.3%	21	67.7%	31		11	29.7%	26	70.3%	37	
Disagree	8	33.3%	16	66.7%	24		7	26.9%	19	73.1%	26	
Not sure	7	63.6%	4	36.4%	11		9	40.9%	13	59.1%	22	0.004*
Agree	5	41.7%	7	58.3%	12		21	67.7%	10	32.3%	31	
Strongly agree	2	50.0%	2	50.0%	4		6	46.2%	7	53.8%	13	

This is an SPSS table in bivariate analysis comparing the nurse tutors work experience and students study experience against different teaching aids for nurse tutors in Malawi. The cut point of the bivariate analysis was 0.05 power value. The analysis was generated from Spearman correlation co-efficient in a two tailed test significance, excluding missing data.

ence as a teaching aid both in class and at the clinical area. But the Spearman correlation co-efficient in a bivariate analysis revealed $0.004 < p = 0.05$. This indicates that student study experience is strongly correlated to use of video conference. Therefore, utilization of the video conference depends on the student study experience. However, some students showed that video conference are rarely done in there colleges as they even do not have a working video screens.

When Spearman correlation co-efficient was used in a two tailed test of significance in a bivariate analysis, the null hypothesis that nurse tutors work experience is not correlated to use of research articles was rejected as the p-value was $0.021 < p = 0.05$. This means that nurse tutor work experience is highly correlated to use of research articles when teaching both in class and at the clinical area. This means that use of research articles by nurse tutors depends on the nurse tutors work experience.

3.3. Association of Nurse Tutors' Work Experience and Nursing Student Study Experience with Use of Teaching Aids

Binary Logistic regression was performed by selecting all dependent variables that showed statistical significance in the bivariate analysis and enter them into the model of logistic regression. This was done after dichotomising the five ranked Likert scale dependent variables to two covariates of "Agree" and "Disagree". "Disagree" was coded 0 to become constant value in our output but not presented in **Table 2**. "Agree" was coded 1 to become our interactive value in the output. With logistic regression analysis the findings reported in this study informed the importance of independent variables of their effect on the dependent variables` odds (see **Table 2**).

This suggest that the effect of the nurse tutors work experience and nursing student study experience influences the dependent variables on teaching aids. It has to be reminded that the main objective one was to explore the tutors teaching aids and how it affects learning with a focus on teaching aids utilization and the challenges. The independent variables or the predictor variables, like nurse tutor work experience and nursing student study experience were compared to different dependent variables on utilization of teaching aids.

The binary logistic regression analysis with the probability stepwise of 0.05 was used as the entry point and 0.1 as the removal point at 95% confidence level. The model also used 0.5 as the probability classification cut-off. In the outcome of the model Omnibus test of model coefficient was selected. It showed clear association of dependent variable use of poster and independent variable nurse tutor work experience as the Odds Ratio was $OR = 1.192$; $95\%CI$ (0.767 ± 1.853); $p = 0.435$. This suggests that the more nurse tutor work experience that one has the more likely that she or he would use the posters when teaching both in class and at the clinical area. This was also the same when the logistic model was used on students. It was clear that the more student study experience that one has the more likely that she or he would use the posters both in class and at the clinical area as the Odds Ratio was $OR = 1.226$; $95\%CI$ (0.539 ± 2.789); $p = 0.628$. This is a true reflection of the students as the p-value for Hosmer and Lemeshow test was strongly, statistically significant at $0.628 > p = 0.05$. Moreover, there was a positive direction of relationship between the dependent and predictor variables since the Beta Coefficient value for nurse tutors equation was $B = 0.176$ and Beta Coefficient value for student equation was $B = 0.203$. This means that the more the years of tutor work experience the more likely that she or he would use posters correctly in class and at the clinical area effectively.

It has been noted that there is no association between the use of the green board and the nurse tutor work experience during teaching in nursing colleges in Malawi. This was done after comparing the predictor variable nurse tutor work experience and the dependent variable use of the white or green board during teaching. A probability stepwise criteria of 0.05 was used for entry point and 0.1 was adopted for the removal point in the equation of the binary logistic regression. The classification cut-off point was set at 0.5. The results of the odds ratio was $OR = 0.912$; $95\%CI$ (0.522 ± 1.594); $p = 0.747$.

It clearly illustrates that if there is an addition of one year as a constant value to the nurse tutor work experience there would be a likelihood chance of 0.912 times less for the nurse tutors to use whiteboard or green board during teaching. However, there has been a negative direction of the relationship between nurse tutor work experience and use of white or green board during teaching in class and at the clinical area. This is because the Logistic regression revealed a Beta Coefficient value of $B = -0.092$. This suggests that if there is an increase in the years for the nurse tutor during teaching there would be a likely decrease in the nurse tutors using the white or green board. But this is not the case with the Beta Coefficient value of the logistic regression equation

Table 2. Association of tutors work experience, students study experience and teaching aids.

Tutors who agree on teaching aids	Tutors work experience						Students study experience					
	B	WARD	sig	ODD	Confidence interval		B	WARD	sig	ODD	Confidence interval	
					Lower	Upper					Lower	Upper
Use of posters	0.176	0.610	0.435	1.192	0.767	1.853	0.203	0.235	0.628	**1.226**	0.539	2.789
Use of white/greenboard	**−0.092**	0.104	0.747	0.912	0.522	1.594	0.302	0.120	0.729	1.353	0.245	7.459
Use of projector	**−0.020**	0.010	0.922	0.981	0.663	1.451	-	-	-	-	-	-
Use of PowerPoint	**−0.230**	0.388	0.533	0.795	0.385	1.638	**1.688**	**3.558**	**0.059**	**5.407**	0.936	31.233
Use of training CD & DVD	**−0.367**	**2.524**	0.112	0.693	0.440	1.090	-	-	-	-	-	-
Use of figurative models	**−0.021**	0.007	0.932	0.979	0.596	1.607	0.235	0.222	0.638	**1.265**	0.475	3.370
Use of research articles	0.064	0.067	0.796	1.067	0.654	1.740	0.536	0.383	0.536	1.709	0.313	9.328
Use of work-book	0.370	**2.241**	0.134	1.447	0.892	2.349	1.112	0.857	0.355	3.040	0.289	32.011
Use of teaching manuals/modules	**−0.129**	0.213	0.644	0.879	0.509	1.518	0.104	0.021	0.884	1.110	0.272	4.535
Use of computer laboratory	0.369	**2.125**	0.145	1.447	0.881	2.378	**−0.819**	**4.332**	0.037	0.441	0.204	0.953
Use of internet	**−0.202**	0.662	0.416	0.817	0.503	1.328	0.060	0.019	0.891	**1.061**	0.452	2.490
Use of teaching CDs from books	**−0.388**	1.896	0.169	0.678	0.391	1.179	-	-	-	-	-	-
Use of chalk	0.342	**2.556**	0.110	10.408	0.926	2.143	-	-	-	-	-	-
Use of library	0.337	10.898	0.168	10.400	0.867	2.261	−1.121	5.723	0.017	0.326	0.130	0.817
Use of video conference	**−0.244**	0.520	0.471	0.783	0.404	1.521	**−1.447**	**9.129**	**0.003**	0.235	0.092	0.601
Small group discussions	−0.301	1.545	0.214	0.740	0.461	1.189	**−0.939**	**5.028**	**0.025**	0.391	0.172	0.888
Use of patients	0.359	**2.184**	0.139	1.431	0.890	2.304	**−0.630**	**2.113**	0.146	0.533	0.228	1.245

This is a logistic regression models with probability classification cut-off of 0.5 and the entry point of p-value of 0.05 in statistics of Hosmer-Lemeshow goodness of-fit. Basing on method of ENTER, the maximum iteration of 20, the equation had a probability of 95% confidence interval. The OR interpretation of above 1 was adopted for the predictor variables of nurse tutor experience and student study experience separately. All the categorical dependent variables under teaching aids and the predictor/independent variables were first tested in the bivariate analysis at p-value of 0.05. All constant values are not tabulated although the models produced. The degree of freedom was set at 1; all teaching strategy dependent and nurse tutor work experience and student study experience which are independent categorical variables were dichotomized coded correctly (with 0 = disagree or lack of the characteristic; 1 = agree, or the presence of the characteristic).

output (B = 0.303) from the student study experience and nurse tutors use of green and white board. The model output indicated that the more years the student study experience the more likely the student has on the use of the green or white board during learning in class. The only main challenge reflected by nurse tutors is dust and irritation from the chalk.

The Odds Ratio of the regression model in the Hosmer and Lemeshow test showed that OR = 5.407; 95%CI (0.936 ± 31.233); p = 0.059 when the predictor variable student study experience was associated with use of power point as learning aid in class. This clearly showed that for any extra added year, of nursing student study experience, there would be a likelihood more chance of 5.407 times that the students would use power point both in class and at the clinical area for learning.

But the similar model for the predictor variable nurse tutor work experience and dependent variable use of power point when teaching showed a negative Beta Coefficient value of −0.230. This definitely shows that any extra added year to nurse tutor work experience would cause a decrease in the utilisation of the power point as a teaching aid both in class and at the clinical area. Yes age has been found to have a strong effect on the utilization of the PowerPoint presentation through LCD. Older nurse tutors are not using the PowerPoint effectively.

It has also to be mentioned that there was strong association between independent variable nurse tutor work experience and the dependent variable, the use of computer laboratory as the odds ratio was OR = 1.447; 95%CI (0.881 ± 2.378); p = 0.145. This binary logistic regression results revealed that any addition of one year to the

tutor work experience, it is expected to increase the chance of nurse tutors using the computer laboratory by 1.447 times. However, the students strongly disagreed that they use the computer lab in their school as the odds ratio was OR = 0.447; 95%CI (0.204 ± 0.953); p = 0.037. This means that for every one year of student study experience there would be a likelihood chance of 0.441 times less for nurse tutors to utilising the computer laboratory. Even the Beta Coefficient value from the binary logistic regression model showed (B = −0.819) a negative direction of the relationship between the student study experience and the nurse tutors utilization of the computer laboratory during teaching. This indicates that any increase to the years of the student study experience there would be a decrease to the nurse tutors utilization of the computer laboratory during teaching the students in Malawi nursing colleges. However, most of the computer Laboratories do not have enough equipment.

Use of the Internet was also found to be not associated to nurse tutor work experience. This was done after comparing the two variables in the binary logistic regression model. The model adopted the probability stepwise of 0.05 as the entry point in the equation and 0.1 as the removal point while the classification cut-off point was set at 0.5. The odds ratio results were OR = 0.817; 95%CI (0.506 ± 1.328); p = 0.416. This entails that if one year is added to the nurse tutor work experience there would be a likelihood chance of 0.817 times for the nurse tutors to use the internet during teaching in Malawi nursing colleges. Therefore, it is not common among the nurse tutors to use internet during teaching in the nursing colleges in Malawi. However, in the student data, there was a borderline association when independent variable student study experience was compared to dependent variable use of internet as the Odds Ratio was OR = 1.061; 95%CI (0.452 ± 2.490); p = 0.891. This indicates that for every one year of student study experience in the nursing college there would a likelihood chance of 1.061 times for the nurse tutors to use the internet. But in the same way, the nurse tutors totally disagree with the students as the Beta coefficient value in the logistic regression output showed −0.202. This means that the more years the nurse tutor has the less likely that she would use internet as a teaching aid when teaching both in class and at the clinical area.

There was also a strong association between independent variable nurse tutor work experience and dependent variable use of chalk in class when teaching as the Odds Ratio was OR = 1.408; 95%CI (0.926 ± 2.378); p = 0.145. The result are from the binary logistic regression model where 0.05 was an entry point in the probability stepwise criteria. The classification cut-off point was set at 0.5. This indicates that for every one year more of nurse tutor experience there would be a likelihood chance of 1.408 times more for the nurse tutor to use chalk during teaching both in class and at the clinical area. The Beta Coefficient value in the model also showed (B = 0.342) a positive direction of the relationship between the nurse tutor work experience and the use of the chalk during teaching in Nursing Colleges in Malawi. Therefore, Use of Chalk is still very common among the nurse tutors in Malawi nursing colleges.

There was also a discrepancy between students and nurse tutors on the use of library as a teaching aid. When students data was analysed in a binary logistic regression for the Hosmer and Lemeshow equation revealed that there is strong association between dependent variable use of library and the independent variable nurse tutors experience as the Odds ratio was OR = 1.400; 95%CI (0.867 ± 2.261); p = 0.168. This is very encouraging as the nurse tutors has shown that for every one year addition to their experience there is 1.400 times likelihood chance for them to use the library as a teaching and learning aid. However, the students did not agree on the use of the library as a teaching aid as the Beta Coefficient value was (B = −1.12). This indicated that the more years of student study experience the less likely that they would use the library as a learning aid during the class period and during the clinical period. But in these library most of the books are very old and very few. They are not enough for the growing number of the students.

It is clear that in all nursing colleges in Malawi, students and nurse tutors disagreed that they have used the video conference as teaching aid during teaching and learning. This was found after using the binary logistic regression model. In the model omnibus test of model coefficient was employed to compare the predictor variable nurse tutor work experience and the dependent variable use of video conference as the teaching aid during teaching. The results showed that the odds ratio was OR = 0.783; 95%CI (0.404 ± 1.521); p = 0.471. This indicates that there is no association between nurse tutor work experience and the utilization of the video conference among nurse tutors during teaching the students in Malawi. In the student data again there was no association between student study experience and the nurse tutors utilization of the video conference as a teaching aid during student teaching. Even the Beta Coefficient values of the binary logistic regression model clearly indicated the negative values of B = −0.244 for tutors and B = −1.447. This means that the negative direction of the relationship between the predictor variable nurse tutor work experience and the dependent variable utilization of

video conference. In this case even the students are strongly disagreeing that they have ever used the video conference as a learning aid. Video conference tend to be expensive to have in these nursing colleges when limitation of budget influence nurse tutors not to use this teaching aid.

Use of patient as a teaching aid has also received mixed feelings from the students and the nurse tutors in this research. When nurse tutor work experience as an independent variable was compared to dependent variable, it was noticed that the odds ratio was OR = 1.431; 95%CI (0.890 ± 2.304); p = 0.139. This indicated that any one year increase in nurse tutor work experience would increase the likelihood chances of use patient as a teaching aid by 1.431 times. In this regard, when the independent variable student study experience was compared to dependent variable use of patient as a learning aid it was noted that the beta value of the regression model was negative direction of relationship (B = −0.630) This means that the if the nurse tutor gain more years of experience in the process of teaching she or he would less likely to be using the patient as a learning aid. This also entailed that nursing students disagreed that tutors use patients as the teaching aid during teaching both in class and the clinical area.

4. Discussion

Posters have long been recognized as an effective medium for disseminating information, particularly with respect to evidence-based practice in nursing. This research has revealed that posters are commonly used in nursing colleges in Malawi although they are expensive to get. But nurse tutors complain of the proper utilization which is a challenge in most of the nursing colleges. The main problem is the availability of the posters which lead nurse tutors not to frequently utilize during teaching. In Cincinnati, Ohio nursing colleges, posters are now also being used for staff education at the clinical level in the surgical, medical, cardiac, and open-heart intensive care units. The benefits are more widespread than originally imagined [10]. If the posters are in good condition they help quality improvement and needs assessment to students' posters can also help to identify and develop topics to present in class and at the clinical area. This process also helped overcome the rigidity in thinking that posters are only for academia. In addition, the opportunity fit well with the hospital's clinical ladder program, because the participating nurses could earn credit [10]. Today many posters are designed with Microsoft PowerPoint templates, but can also lay out the sections of the poster on a large piece of poster board before finalizing it.

Use of PowerPoint in Malawi nursing colleges has been very common among nurse tutors. PowerPoint utilization works with an LCD machine. The main challenge of the nurse tutors is on how to operate the LCD machine and the computer. While we do appreciate that Malawi nursing colleges have not more than 3 - 5 LCD machine against 15 - 20 nurse tutors to use in a class where not less than 150 students are learning, it becomes an administrative problem on not owing more of these teaching aids. This is because if they are many, more nurse tutors, can utilise and become acquainted to the operational system [11]. The primary roles that nurse tutors have is to perform as a teacher in class and at the clinical area. Teachers at every level prepare plans that aid in the organization and delivery of their daily lessons. These plans vary widely in the style and degree of specificity on use of the PowerPoint. Some instructors prefer to construct elaborate detailed and impeccably typed outlines in PowerPoint; others rely on the brief notes in the PowerPoint and present clearly. Therefore, mastering the use of LCD and computer would not be necessarily the only option but on how to create the PowerPoint in the computer. If the PowerPoint has been created properly in the computer and the words are not clouded, chances of clear presentation among many students is very possible.

Use of figurative models or manikins in Malawi nursing colleges is very challenging. Basically human simulation aims to imitate reality whilst offering a skills-based clinical experience in a safe and secure environment [12]. But this format of using the manikins is a very difficult process in Malawi. The challenge is not only the availability of the adequate manikins for a large student class but also on the technical utilization of the manikins by nurse tutors. It has to be noted that the availability of Manikins are donor related in Malawi nursing colleges as they are very expensive and only produced outside the country. Not many colleges have more than 5 working manikins and other anatomical figurative models. This gives tough time for nurse tutors to conduct a demonstration session to large class of students as one topic would consume more hours due to student group division.

Use of research articles when teaching is gaining ground in Malawi nursing colleges due to availability of the internet. But many nurse tutors and students disagreed that they use this type of teaching aid. This is because in most colleges the resource of research articles or journals are not up to the standard in most college libraries. In

Turkey, researchers conducted a study on how nurses perceive the barriers to and facilitators of research utilization [13]. However, this study lacked validity and reliability, and barriers and facilitators of research utilization were not reported in rank order. No further studies of the use of Evidence Based Practice in nursing have been attempted in Turkey. Therefore, in Malawi nursing colleges, there is even no proper orientation on how to use research article in getting latest literature on a particular subject.

It has been found that nurse tutor tutors mostly use workbook or teaching modules when teaching although students did not agree. The discrepancy is coming in because of the availability of the teaching modules where most students do finish learning the module without owing the single copy of the workbook. While the aim of the teaching module is to uplift the presence of self-directed learning among students in nursing but the availability of the teaching modules gives a big challenge. Another researcher pointed out that with the complexity and degree of change in practice today, nurses should be encouraged to take responsibility for their own learning [14]. Even in America Studies have been conducted to explore the amount of time nurses spend on self-directed learning using modules. When the students were asked to recall their learning experiences, and differences in memory, it was high. But in Malawi with few teaching modules it is very difficult to highly recall what they have learnt or covered in the module.

Use of the computer laboratory in Malawi nursing college is still to start in most colleges. Computer laboratory assist students to get current information concerning nursing globally, regionally and locally. Many colleges do not have computer laboratory where they can search information from the net or learn how to type assignments. This affects the computer skill and internet skills. There were no significant (0.145 $p < 0.05$) baseline between the computer and nursing lecture groups by education or computer skills [15]. Results also noted that showed significant differences between the two groups in cognitive gains and nursing student satisfaction ($p = 0.01$), with the computer group demonstrating higher student satisfaction and more cognitive gains than the lecture group. The groups were similar in their ability to demonstrate the skill correctly. But this is not the case with the third world developing country like Malawi as this study student odds ratio on computer utilization was 0.441. Although it is imperative to compare USA students and Malawi students but the availability of the computers reduce the quality performance of the nursing graduates at the same level with the USA student.

Although use of chalk could behave as the old fashion in some countries, but in Malawi it is still being used in class for student learning in the colleges. The challenge of the Chalk and nursing students is the availability of the dust to white uniform. White chalk could be easy to use but the coloured chalk tend to dent the nursing traditional white colour both to the students and the nurse tutors [16]. But what is amazing is that this is the common teaching aid for nurse tutors in Malawi. Therefore, a lot of the nurse tutors and students agreed that chalk cause discoloration of their uniform. With the complexity and degree of change in nursing practice today, nurses should be encouraged to take responsibility for their own learning [17]. However, even when adult nursing students are willing to assume responsibility for their own learning, they will have different aptitudes for certain kinds of learning like the use of chalk in class while putting on their traditional white uniform.

Use of patient has been statistically noted to be very common among nurse tutors and students in Malawi nursing colleges (OR = 1.431; 95%CI (0.890 ± 2.304); $p = 0.139$). This clear shows that nurse tutors use the patients when teaching as a teaching aid particularly in the clinical area. The reality teaching and hands on the patients create student confidence very early in the profession. In Malawi, students start touching the patient through care in year one by doing basing nursing care like bed bath and bed making. In this process students gain trust on procedures and master the skills very early [18]. It is very important to note that even nurse tutors when they are teaching in class they sometimes bring real patient like mild anaemic patient so as to show the signs and symptoms to students right away during teaching. This give credit to the learning process as it acts as a motivation to students and internalization of the information is very high. While simulation is becoming an option to modern nursing, but use of real patient as teaching aids cannot have a reality replacement.

5. Conclusion

Use of teaching aids is having a big challenge among nurse tutors because of shortage and poor funding. With adequate funding availability of the materials like manikins and LCD would cause remarkable nurse tutor improvement in teaching both in class and at the clinical area. Use of patient as a teaching aid if ethically followed remains the most realistic teaching in nursing for developing countries where simulation technology for Best Emergency Medical Education (BEME) is still limited. There is a need to develop the teaching strategies that would be conducive with the current scarcity of the teaching aids.

References

[1]   Ministry of Health (2008) Annual Report; Nursing Section. Lilongwe.

[2]   Ministry of Health (2012) Annual Report on Nurse's Performance: Capitol Hill. Lilongwe.

[3]   Ministry of Health (2010) Biannual Conference, Karikuti Hotel. Lilongwe.

[4]   Nurses Council of Malawi (2012) Annual Report on Nursing Education.

[5]   Grigulis, A.L. (2010) Lives of Malawian Nurses: Stories behind the Statistics. PhD Thesis, Centre for International Health and Development, University College London.

[6]   Nurse Council of Malawi (2006) Annual Report; Progress of Nurses in Development. Lilongwe.

[7]   Chirwa, M. (2007) Performance of CHAM Nursing Schools. Lilongwe.

[8]   Dennis, H. and Duncan, C. (2011) Introduction to Research Methods in Psychology. 3rd Edition, Loughborough University Press, Prentice Hall. www.pearsoned.co.uk/howitt

[9]   Rivera, R. (2011) Research Ethics Training Curriculum. 2nd Edition, Family, Health International. www.fhi.org

[10]   Gina, M. (2002) Posters Give Nursing Staff Consistent Information. *Critical Care Nurse*, **22**, 152. http://ccn.aacnjournals.org/

[11]   Maunye, T.J., Meyer, S.M. and van, V.C.E. (2009) An Assessment of Teaching Strategies. Used by Lecturers at a Nursing College in Mpumalanga. *Curatiouis*, **32**, 30-37. http://dx.doi.org/10.4102/curationis.v32i3.1221

[12]   Cant, R.P. and Cooper, S.J. (2010) Simulation-Based Learning in Nurse Education: Systematic Review. *Journal of Advanced Nursing*, **66**, 3-15. http://dx.doi.org/10.1111/j.1365-2648.2009.05240.x

[13]   Yava, A., Tosun, N., Çiçek, H., Yavan, T., Terakye, G. and Hatipoğlu, S. (2009) Nurses' Perceptions of the Barriers to and the Facilitators of Research Utilization in Turkey. *Applied Nursing Research*, **22**, 166-175. http://dx.doi.org/10.1016/j.apnr.2007.11.003

[14]   O'Shea, E. (2003) Self-Directed Learning in Nurse Education: A Review of the Literature. *Journal of Advanced Nursing*, **43**, 62-70. http://dx.doi.org/10.1046/j.1365-2648.2003.02673.x

[15]   Jeffries, P.R. (2001) Computer versus Lecture: A Comparison of Two Methods of Teaching Oral Medication Administration in a Nursing Skills Laboratory. *The Journal of Nursing Education*, **40**, 323-329.

[16]   Banning, M. (2005) Facilitation of Teaching Strategies in Nursing. *Nurse Education Today*, **25**, 502-508. http://dx.doi.org/10.1016/j.nedt.2005.03.007

[17]   Polit, D. and Beck, C.T. (2003) Nursing Research: Principals and Methods. Williams Book Company, New York.

[18]   Tomietto, M., Saiani, L., Palese, A., Cunico, L., Cicolini, G., Watson, P. and Saarikoski, M. (2012) Clinical Learning Environment and Supervision plus Nurse Teacher (CLES + T) Scale: Testing the Psychometric Characteristics of the Italian Version. *Giornale Italiano di Medicina del Lavoro ed Ergonomia*, **34**, B72-B80.