Quality of Care Offered by Nurses Trained under the Decentralised Model and Those Trained under the Traditional Model: A Comparative Study

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Abstract

Zambia has a shortage of nurses and midwives spanning from early 2000 and the situation is more dire in rural areas, where many young nurses and midwives are reluctant to live. The skill-based shortage is of concern in a healthcare context characterised by global health indicators such as high maternal mortality ratio, high under-five mortality ratio, high HIV prevalence rate, and a life expectancy lower than the global average. In order to address the above challenges, a decentralised placement model in the training of nursing students was introduced at St. Lukes College of Nursing and Midwifery. The aim of this study was to investigate the quality of nursing and midwifery care provided by graduates from the decentralised clinical training model against the cohort of graduates of the traditional model of Nursing and Midwifery training. The study utilised a cross sectional analytical study design involving 143 nurses and midwives from Chitambo and St Luke's College of Nursing and Midwifery working at various selected health facilities across the country between November 2020 and February 2021. The respondents were conveniently selected and in the case where graduates on the list could not be reached, snowball sampling technique was used. Data was collected using a standardised checklist as the respondents performed mandatory procedures. To supplement information obtained from assessment of the candidates, a 5-point Likert scale questionnaire was used to obtain information from their supervisors, on additional aspects of graduates' clinical competences. The data were analysed using the Statistical Package for Social Sciences (SPSS) version 26. Measures of central tendency were used to analyse the data on demographic characteristics of the respondents, while Chi square was used to

determine the relationship between variables. In addition, independent samples t-test was used to determine the significant differences in means between the two groups. Results of the t-test show that there was no significant difference on overall knowledge levels between graduate nurses from the decentralised model of nurse training (M = 3.24, SD = 0.93) and the traditional model of nurse training (M = 2.58, SD = 1.07), p = 3.285. In terms of skills, the study highlighted a significant difference in overall skills levels between graduate nurses from the decentralised model of nurse training (M = 23.52, SD = 3.02) and the traditional model of nurse training (M = 21.72, SD = 3.14), p = 0.018. In addition, results indicated a significant difference in overall attitudes towards patient care between nurses trained from the decentralised model of nurse training (M = 23.52, SD = 3.20) and those trained from the traditional model of nurse training (M = 21.73, SD = 3.15), p = 0.017. Comparison of supervisors' rating of graduates overall clinical skills revealed no significant difference in nurses trained under the decentralised model (M = 3.34, SD = 0.88) and those trained under the traditional model (M = 3.21, SD = 0.77), p = 0.119. From this study, it can be concluded that some specific aspects of knowledge, skills and attitudes of graduate nurses are influenced by the model used in their training. Based on these results, the decentralised model of training can be recommended for scale-up to all nursing and midwifery training institutions.

1. Background

The traditional training model has been used for training nurses and midwives since time immemorial. This model has mainly focused on hospital-based internship, coaching and mentorship. The strength of this particular practical model of training lays in the potential to train nursing students under close supervision and assessments by assigned mentors. For Benner et al. (2010), this model is considered somewhat outdated in the modern health care system. There has been growing awareness that the traditional practical training model can limit placement learning experience because of limitation to certain shifts, restrictions on student numbers at placement sites, and the high cost of appointing nurse educators or mentors required for this type of approach (Sweet & Broadbent, 2017).

In order to address the above challenges which accompany the traditional model of training, a decentralised placement model serves as an alternative approach because it offers benefits such as ability to function in a multidisciplinary team, increased placement capacity, improved competencies for staff, and students get better prepared for deployment in varying environments. A decentra-

lised practical training model, shifts training from traditional, urban-based healthcare settings, typically localised around the academic structures usually adjacent to the main hospital, to rural communities (De Villiers et al., 2017; Van Staden, 2018). In 2012, SolidarMed developed and successfully piloted a decentralised nurse training model at St. Luke's College of Nursing in order to produce higher numbers of nurses ready for work in rural districts of Zambia (Weber et al., 2017). The decentralised nurse training model has proven to be effective in doubling the number of graduated nurses. By the end of 2018, 469 nurses finished their training in the new model (GNC, 2019). Apart from increasing the numbers of nursing graduates, the decentralised model was aimed at delivering quality nursing care.

To the investigators' knowledge, no research has been conducted on the quality of nursing and midwifery care provided to patients by graduates from the decentralised clinical training model. Therefore, this research aims to fill this knowledge gap by contrasting the quality of nursing and midwifery care provided to patients by graduates of both the decentralised and traditional models of training.

2. Methods and Measures

A cross sectional analytical study involving 143 nurses and midwives in selected health facilities across the country was conducted to evaluate the quality of Nursing and Midwifery care provided by a cohort of graduates of the decentralised model against the cohort of graduates of the traditional model of Nursing and Midwifery training. The study population was all Nursing and Midwifery graduates of the decentralised model of training, and graduates trained in the same period (2015-2017) using the traditional model of training.

The graduates were conveniently selected from the lists obtained from the respective institutions. In the case where graduates on the list could not be reached, snowball sampling technique was used to access graduates from the decentralised, and the traditional models of training. Upon gaining access to the health facility, with permission from the Medical Officer in-charge, the Nurse in-charge was requested to assist with identifying nursing staff to participate in the study. Those who met the inclusion criteria were then approached and an information sheet explaining the nature and purpose of the study was given to the respondents after which, those who were willing to participate in the study were given an informed consent form to sign.

Before commencing the interview or administering the questionnaire, the researcher introduced himself/herself to the study respondents and verbal permission obtained. The purpose of the study was explained, and assurance of confidentiality made. When the respondents agreed to participate in the study, written consent was obtained.

For this study, a structured questionnaire was used to obtain demographic characteristics of the respondents while competency in clinical skills were assessed using a standardized checklist which was used to observe the graduates

performed a mandatory procedure. The checklist assessed knowledge, clinical skills and attitude. Clinical skills included the following variables; performing hand hygiene, assessing client's needs, assembling of equipment, performing the procedure, observing the client throughout the procedure and dismantling of equipment from the trolley. In addition, the aspect of attitude comprised the following items; greeting the client, introducing self and explaining the procedure to the client, obtaining consent, maintaining client's privacy, regard of client and family, reporting and handing over of care to other staff.

A 5-point Likert scale questionnaire was used to obtain information on aspects of graduates' clinical competences from their supervisors in order to supplement information obtained from assessment of the graduates.

2.1. Ethical Considerations

Ethical approval to conduct the study was obtained from the Levy Mwanawasa Medical University Research Ethics Committee (LMMU-REC) and the National Health Research Authority (NHRA). Clearance was also sought from the medical Superintendents of the respective health facilities where the identified graduates worked. Before accessing the graduates, permission was obtained from their in-charge who also helped to identify eligible respondents. The respondents were informed of the nature and purpose of the study both orally and in writing so that they could make informed decisions regarding their participation. Written informed consent was also obtained from all the respondents. Participation in the study was voluntary and the graduates' had the right to withdraw from participation whenever they felt like, without any prejudice. Confidentiality regarding information that was volunteered was maintained throughout the study process. No names of respondents were recorded anywhere for the purpose of confidentiality. Further, respondents were not subjected to any physical harm as the study did not involve any invasive procedures.

2.2. Data Analysis

The collected data was analysed using the Statistical Package for Social Sciences (SPSS) version 26. Measures of central tendency were used to analyse the data on demographic characteristics of the respondents, while Chi square was used to determine the relationship between variables. In addition, independent samples t-test was used to determine the significant differences in means between the two groups. Frequency tables and graphs have been used for presentation of data.

3. Results

A total of 143 graduate nurses trained under the traditional and decentralised nurse training models were recruited to participate in the study as highlighted in Table 1. Forty-one graduates were not accessible, thereby giving a usable response rate of 71.3 percent. The forty-one graduates could not be accessed because they had not yet been employed.

Table 1. Demographic characteristics of respondents (N = 102).

Variable	N	(%)
College Attended		
St Luke's	59	57.8
Chitambo	43	41.2
Gender		
Male	18	17.6
Female	84	82.4
Marital Status		
Married	19	18.6
Single	80	78.4
Divorced	1	1.0
Widowed	1	1.0
Religious Affiliation		
Roman catholic	41	40.2
Pentecostal church	26	25.5
Seventh day Adventist	10	9.8
Jehovah's witness	6	5.9
United church of Zambia	11	10.8
Others	8	7.8
Work Location		
Rural health centre	12	11.8
Urban health centre	29	28.4
District hospital	17	16.7
General hospital	15	14.7
Central hospital	26	25.5
Current Department		
Out patient's department	50	49
Casualty	5	4.9
Admission ward	4	3.9
Medical/ surgical ward	27	26.5
Maternity	9	8.8
Work Experience		
Less than one year	55	53.9
1 - 2 years	23	22.5
Above 2 years	20	19.6

Among the respondents accessed, the mean age was 26 years with majority (78.4%) being single and mostly belonging to the Catholic faith (40.2%). Major-

ity (57.8%) were trained using the decentralised model while the rest (41.2%) were trained using the traditional model. Furthermore, results showed that most respondents worked at urban health centres (28.4%) and central hospitals (26%). In addition, many worked at the outpatient department (50%) with majority (55%) having work experience of less than one year.

Comparing knowledge levels between the two cohorts, t-test (Table 2) shows there to be no significant difference in overall knowledge levels between graduate nurses from the decentralised model of nurse training (M = 3.24, SD = 0.93) and those from the traditional model of nurse training (M = 2.58, SD = 1.07), p = 3.285. However, independent-samples *t-test* was statically significant for specific differences in knowledge between graduates trained from the decentralised and traditional models (p = 0.007), and having given appropriate Information, Communication and Education (IEC) (p = 0.002). An examination of the group means on prerequisite knowledge reveals that nurses trained from the decentralised model performed significantly better (M = 2.52, SD = 0.68) than nurses trained from the traditional model (M = 2.07, SD = 0.93). Similarly, nurses trained under the decentralised model (M = 2.11, SD = 1.01) scored more in terms of giving appropriate IEC than those trained under the traditional model (M = 1.44, SD = 1.05). On the other hand, results of the t-test indicate no significant difference in mean scores for disposal of waste (p = 0.071), decontamination of used instruments (p = 0.091), and documentation of procedure done (p = 0.214).

Results in Table 3 show that nurses who were trained through the decentralised model scored significantly more in performing hand hygiene before, during and after the procedure (M = 7.2281, SD = 2.31469) than those from the traditional model of nurse training (M = 4.8571, SD = 3.30241), p = 0.000. Furthermore, results indicate that graduate nurses from the decentralised model of training observed the client response more (M = 2.32, SD = 0.579) during the procedure than those from the traditional model of training (M = 1.77, SD = 0.75), p = 0.000.

Table 2. Comparison of mean scores for respondents knowledge levels.

Variables	Decentralised model of training N = 59		Traditional model of training N = 43		*P*-value
	Mean	SD	Mean	SD	
Prerequisite knowledge	2.5172	0.68162	2.0732	0.93248	0.007
Appropriate IEC is given	2.1053	1.01214	1.4419	1.05339	0.002
Disposal of waste	2.5000	0.89443	2.1282	1.08044	0.071
Decontamination of used instruments	2.1071	1.02120	1.7297	1.07105	0.091
Documentation after procedure	2.4655	0.73067	2.2558	0.95352	0.214
Overall knowledge	3.2373	0.93475	2.5814	1.07421	3.285

Table 3. Comparison of mean scores for respondents' clinical skills.

Variables	Decentralised model of training (N = 59)		Traditional model of training (N = 43)		P-value
	Mean	SD	Mean	SD	
Performs hand hygiene	7.2281	2.31469	4.8571	3.30241	0.000
Assesses the client's stated and unstated needs and meets them appropriately	1.7797	1.00117	1.5000	0.70711	0.103
Performs procedure systematically	2.3898	0.69523	2.1860	0.79450	0.181
Observes the client response throughout the procedure	2.3273	0.57910	1.7674	0.75078	0.000
Dismantles the trolley	2.5893	0.80401	2.0256	0.90284	0.002
Overall skills	23.52	3.02	21.72	3.14	0.018

0.75), $p = 0.000$. In addition, graduate nurses from the decentralised model of training performed significantly better (M = 2.59, SD = 0.80) with regard to dismantling of the trolley (equipment) after the procedure than those from the traditional model of training (M = 2.03, SD = 0.90), $p = 0.002$. Generally, t-test results have highlighted a significant difference in overall skills levels between graduate nurses from the decentralised model of training (M = 23.52, SD = 3.02) and the traditional model of training (M = 21.72, SD = 3.14), $p = 0.018$.

In terms of attitudes, results (Table 4) of the t-test indicate a significant difference in overall attitudes towards patient care between nurses trained from the decentralised model (M = 23.52, SD = 3.20) and those trained from the traditional model (M = 21.73, SD = 3.15), $p = 0.017$.

Results in Table 5 show that 50.8 percent of the respondents who were trained under the decentralised model were found to have very good knowledge compared to only 10 percent of those who went through the traditional model of training. On the other hand, 20.9 percent of those who had poor knowledge were trained under the traditional model while only six percent of those trained under the decentralised model were found to have poor knowledge. Therefore, a statistically significant relationship was found knowledge levels and model of training, $X(3, N = 102) = 10.18$, $p = 0.017$.

Table 6 shows that most of the respondents (66.1%) who had very good clinical skills were trained under the decentralised model compared to 37.2 percent of those who were trained under the traditional model who were found to have very good clinical skills. As such, the Chi-square test revealed a significant association between training model and clinical skills, $X(3, N = 102) = 9.49$, $p = 0.023$.

T-test results in Table 7 illustrate a statistically significant disparity in supervisors' rating of nurses' attitudes between those trained under the decentralised model (M = 1.84, SD = 0.37) and those trained under the traditional model (M = 1.72, SD = 0.45), $p = 0.003$.

Table 4. Comparison of mean scores for respondents' attitude towards patient care.

Variables	Decentralised model of training N = 59		Traditional model of training N = 43		P-value
	Mean	SD	Mean	SD	
Greets the client with respect	2.6780	0.47127	2.2326	0.64871	0.000
Introduces self to the client and explains the procedure	2.4237	0.74749	2.1628	0.92402	0.118
Obtains consent from the patient	2.6102	0.76602	1.9302	1.00937	0.000
Maintains privacy	2.1525	0.84718	2.1190	1.06387	0.866
Approach to patient and family	2.1579	0.72677	2.0233	0.80144	0.382
Reporting/handing over to other staff/senior staff	1.8276	1.21595	1.3256	1.06281	0.033
Overall attitudes	23.5238	3.20242	21.7273	3.14516	0.017

Table 5. Knowledge in relation to college trained from.

Model of training	Knowledge levels				Total	p = 0.017
	Poor	Fair	Good	Very good		
Decentralised model	4 (6.8%)	8 (13.6%)	17 (28.8%)	30 (50.8%)	59 (57.8%)	
Traditional model	9 (20.9%)	10 (23.3%)	14 (32.6%)	10 (23.3%)	43(42.2%)	
Total	13 (12.7%)	18 (17.6%)	31(30.4%)	40 (39.2%)	102 (100%)	

Table 6. Skills in relation to college attended.

Model of training	Skills level				Total	p = 0.023
	Poor	Fair	Good	Very good		
Decentralised model	7 (11.9%)	9 (15.3%)	4 (6.8%)	39 (66.1%)	59 (57.8%)	
Traditional model	6 (14%)	16 (37.2%)	5 (11.6%)	16 (37.2%)	43 (42.2%)	
Total	13(12.7%)	25 (24.5%)	9 (8.8%)	55 (53.9%)	102 (100%)	

Table 7. Comparison of supervisors' ratings of graduates' overall attitude.

Variables	Decentralised college N = 59		Traditional college N = 43		P-value
	Mean	SD	Mean	SD	
Overall clinical skills	1.8448	0.36523	1.7209	0.45385	0.003

4. Discussion

To the authors' knowledge, this is the first study conducted to compare quality of nursing care focusing on knowledge, skills and attitude of graduates of two

different models of training in nursing training in Zambia. The study sought to compare the quality of nursing care provided by nurses trained under the decentralised model with those trained under the traditional model using a checklist to capture knowledge, skills and attitude of respondents from the two training models. In addition, a 5-point Likert scale questionnaire for' supervisors was utilised to obtain ratings on respondents' attitudes to patients and families, communication skills with clients and members of the multi-disciplinary team, teamwork, leadership skills, and observance of professional ethics.

4.1. Demographic Characteristics

The study revealed that majority of respondents (82.4%) were females while 17.6 percent were male. The higher number of females in the study is being attributed to the historical nurture of the nursing profession which has been predominantly female. Furthermore, this study showed that most of the respondents (28.4%) from both models were deployed in urban areas compared to rural areas (11.8%). This is in contrast with the aim of decentralised model which is designed to increase graduates' interest to work in rural areas as highlighted by de Villiers et al. (2017), whose research evidence suggests that nurses trained in community-based settings (decentralised training model) are more likely to work in those areas after their training than those who have not been exposed to such placements. The probable reasons for the high number of graduates of the decentralised model working in urban areas might be due to a disconnect between the Government as the largest employer and the training institution that graduates decentralised model nurses, where the employer may be unaware of the initial reason for introducing the decentralised model of training. In addition, considering that nursing has been a predominantly female profession, family factors such as marriage may also have influence on the choice of work station.

4.2. Knowledge Levels

Results of this study have revealed a statistically significant relationship between model of nurse training and knowledge level (x = 10.176, p = 0.017). Most of the respondents who scored very highly in knowledge levels were those who trained under the decentralised model compared to those trained under the traditional model (Table 2). This is in line with de Villiers et al. (2017) who assert that students trained under the decentralised model have reported more meaningful learning experience than they would receive at the hospital where their training institution is located. This consequently, places them at an advantage in terms of knowledge acquisition than their peers who trained under the traditional model (Birden & Wilson, 2012).

4.3. Clinical Skills

Results of this study have revealed a statistically significant relationship between

model of nurse training and graduate skills (x = 76.80, p = 0.000). Graduate nurses from the decentralised model of nurse training performed better in terms of clinical skills (M = 23.52, SD = 3.20) than those from the traditional model of training (M = 21.72, SD = 3.14), p = 0.018. This corroborates with Gaede (2018) whose study showed that decentralised clinical training produces medical graduates who are competent and confident to work in various health systems throughout the world. Similarly, Mlambo et al. (2018) acknowledged that the decentralised model of training improves clinical skills and personal and professional development. They further indicate that decentralised model of training provides a rich learning experience as compared to the traditional model.

Axley (2008) postulates that clinical skills of nurses have a direct effect on the safety and health of patients, and the lack of them can contribute to medical errors and adverse outcomes for the patients. Thus, it may be inferred the clinical performance and competence of nurses trained under the decentralised model are more likely to contribute towards enhanced patients' wellbeing.

Tesfaye et al. (2015) writing from Ethiopia reveal that clinical competence has a positive relationship with nurse performance at work. The authors further state that nurses who had good clinical skills were fourteen times more likely to have a good performance at providing nursing care than those with poor clinical skills.

While the present study revealed a significant relationship between model of nurse training and nurse graduate skills as shown in Table 3, it is in contrast with the views of nurses' supervisors report which showed no significant association between model of nurse training and nurse graduate clinical skills. The dissimilarity in the finding may be attributed to lack of objectivity arising from the familiarity between supervisors and subordinates which may have compromised the supervisors' objectivity.

Results of the current study have revealed that nurses with work experience of less than 1 year scored higher on clinical skills than those with work experience of more than 1 year. Further, the study findings also show that nurses from the decentralised training model performed better than those from the traditional model. Therefore, it can be implied that most of those with experience of less than a year and performed better in terms of skills were from the decentralised training model. Nevertheless, there is scarcity of research evidence to support the above findings. This finding is surprising in the sense that it is evident that the longer someone has worked and practices, the better their skills are likely to be (Takase, 2013), who found that skill levels of nurses were higher in those with a longer work experience compared to those with a shorter work experience. This unexpected study finding may be attributed to the manner in which graduates from the decentralised model were trained, where greater focus was placed on the development of clinical competences throughout their training. On the other hand, the poor performance on the part of graduates of the tradi-

tional model of training, may be attributable to the manner in which clinical placements have been programmed, mainly being undertaken within the hospitals where the training institution is located. Further, the differences skills may be related to differences in environment which they operated, vis a vie leadership styles and availability of equipment.

Generally, graduates of both training models reported challenges in their practice which were mainly related to inadequate equipment and consumables, staff shortages, and lack of motivation among others. These findings are similar to Poor et al.'s (2019) results which highlighted unavailability of medical and surgical supplies, staff shortages, and lack of motivation as some of the factors that affect provision of quality of care among nurses.

4.4. Nurses' Attitude

The present study reveals that the model of nursing training and the attitude of nurses are linked to a statistically significant degree (x = 3,796; p = 0.051) to the effect that graduates of the decentralised model of training scored higher on positive attitude towards patient care in comparison with those trained under the traditional model (Table 4). The link between model of training and nurses' attitudes was also confirmed by nurse supervisors' observations (Table 7). This finding is in line with de Villiers et al.' (2018) assertion that decentralised model of training facilitates the building and shaping of right attitudes among health professionals. Right attitudes among health professionals have been linked to provision of quality health care (Dias et al., 2012; Haskins et al., 2014). The quality of treatment and health outcomes are likely to be influenced by nursing attitudes. Frazer et al. (2011), for instance, found that negative nursing behaviours influenced elderly patients and other vulnerable patients negatively

Further, Crothers and Dorrian (2011), argue that these basic concepts of patient care can not only influence the quantity, but the standard of care that nurses provide. This confirms the assertion that graduates of the decentralised model of training have a higher probability of delivering quality care than those trained under the traditional model and assures high quality of care provided to patients, families and communities resulting in better health outcomes (Gaede, 2018).

4.5. Knowledge and Clinical Skills

A significant association has been shown between knowledge and clinical skills (x = 76.80, p = 0. 000). Graduates who scored highly in knowledge also showed very good clinical skills. This result is in tandem with Oyira et al. (2016), writing from Nigeria whose findings showed that quality nursing care is significantly affected by knowledge. Kiyancicek et al. (2014) consider nurses with outstanding knowledge to be more capable of providing quality nursing care.

Similarly, de Villiers et al. (2017) reported that decentralised training model offers a better opportunity for health care workers to enhance their competences and provide quality health care.

5. Conclusion

From this study, it can be concluded that knowledge, skills and attitudes of graduate nurses are influenced by the model used in their training. This is evident from the differences in the scores between graduates of the decentralised model of training and those from the traditional model, where those from the decentralised model scored higher than those from the traditional model. Therefore, the significance in the relationship between knowledge, skills, attitudes, and model of training may be an indication of the role of the decentralised model in improving competences, which may consequently lead to improved quality of nursing care. Based on these results, the decentralised model of training can be recommended for scale-up to all nursing and midwifery training institutions.

Authorship Statement

Solidarmed Zambia provided financial support to conduct the study. Lonia Mwape, Esther Chirwa, Kanyata Kanyata and Kestone Lyambai developed the proposal and collected the data. Kanyata Kanyata and Kestone Lyambai working closely with Esther Chirwa performed the data analysis. All the authors participated in the drafting of the manuscript, reviewed it, and accepted the final version before submission for publication.

Conflicts of Interest

Authors declare no financial or other potential conflicts of interest.

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