

## **Adequacy and sustainability of undergraduate midwifery programmes training course materials**

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### **Abstract**

The purpose of the study was to determine the adequacy and sustainability of Undergraduate midwifery programmes training course materials. A quantitative survey method was employed to collect sustainability data from lecturers and clinical supervisors (N=33) and data on adequacy of the training course materials from graduated professional nurses doing their community service (N=34). The data was analyzed using SPSS programme for frequency distributions and percentages. More than 90% of the participants stated that the integrated PMTCT training course materials were sustainable. Participants stated that they were unlikely or very unlikely to exclude PMTCT competencies from the undergraduate midwifery programme: PICT (provider-initiated counselling and testing)/HCT (HIV counselling and testing) course unlikely (60.61%) and very unlikely (30.3%); antiretroviral therapy (ART) course unlikely (33.33%) and very unlikely (60.61%); PCR testing course unlikely (48.48%) and very unlikely (39.39%); and infant-feeding management course unlikely (27.27%) and very unlikely (66.67%). The course was regarded as very adequate or fairly adequate: PICT/HCT very (59%) and fairly adequate (49.2%); antiretrovirals/ART very (64.7%) and fairly adequate (32.4%); polymerase chain reaction training very (52.9%) and fairly adequate (41.2%); and infant-feeding options very (73.5%) and fairly adequate (26.5%). The results of this study show that PMTCT competency-based course materials were adequately provided to undergraduate midwifery students to equip them with necessary knowledge and skills in management of the PMTCT client. The PMTCT course was regarded as sustainable, which influences its continuation in the midwifery programme after the end of the PMTCT project.

**Keywords:** PMTCT, competency course, adequacy of training, integrated programme, sustainability of course materials.

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## **Introduction**

South Africa has the highest number of pregnant women who are HIV-positive, and more than 70 000 babies were born infected with HIV annually (World Health Organization (World Health Organization, 2011). According to the national antenatal survey HIV/AIDS prevalence among women aged 15–49 years using public antenatal facilities was 29.3% (Geffen, 2009). The study further indicated that South Africa is one of only 12 countries in the world whose

child health outcomes deteriorated from the year 2000 (World Health Organization, 2011). At the same time the maternal mortality ratio is increasing, and is at 20 times more than the target ratio to meet the Millennium Development Goals by 2015 ( World Health Organization, 2011). This is due to the high rates of antenatal HIV infection in the country.

A study conducted in Kouga, Eastern Cape identified that out of 67% of pregnant women tested for HIV, 43% had been tested only during previous pregnancies, and 80% of HIV-positive women reported using some form of family planning, but only 11% reported using condoms (Rispel, Peltzer, Phaswana-Mafuya, Metcalf & Tregre, 2007). The findings also indicated that although clinical staff had received some form of training about HIV/AIDS policies, they were uncertain about family planning guidelines for HIV-positive mothers.

A study in Uganda identified HIV-positive women as facing many challenges in making choices regarding infant feeding and family planning (Nuwagaba-Biribonwoha, Mayon-White, Okong & Carpenter, 2007). Ahoua, Guenther, Pinoges, Anguzu, Chaix, Le Tiec, Balkan, Suna, Olson, Olaro and Pujades-Rodriguez (2009) assert that enhancing quality of infant-feeding counselling is essential to improve effectiveness of PMTCT services in rural Africa. Doherty, McCoy and Donohue (2005) found that the coverage of PMTCT training was sub-optimal in South Africa, with less than one-third of clinical staff trained in PMTCT and HIV including infant feeding. The study revealed that the staff who had not attended formal training courses did not feel confident to provide PMTCT services. They, therefore, left the responsibility to the few trained staff members (Nuwagaba-Biribonwoha et al., 2007).

The severe shortage of skilled health care workers in many developing countries remains a major barrier to development and expansion of lifesaving child health services such as PMTCT (Podhurst, Hoyt, Dube, Nhlapo, Connell & Ayisi, 2009). In order to improve the quality of PMTCT services it is essential that the numbers of health workers trained in PMTCT and paediatric care be increased. Horwood, Haskins, Vermaak, Phakathi, Subbaye and Doherty (2010) suggested that enrolled nurses be trained in PMTCT to facilitate integration of PMTCT into routine child services. This would improve the follow-up of HIV- exposed children, since most immunisation clinics are conducted by enrolled nurses.

A study conducted in northern Tanzania identified that nurse counsellors lacked adequate knowledge, skills and confidence to provide proper counselling and relevant advice to HIV-positive women on how best to feed their infants (Leshabari, Blystad, & Moland, 2007). The findings further illuminate the immense burden placed on nurses in their role as infant-feeding counsellors in PMTCT programmes, and suggested the need to empower the professional

nurses with adequate knowledge and skills to increase their confidence and performance (Leshabari et al., 2007). A similar study by Chopra, Doherty, Jackson and Ashworth (2005) in South Africa found that while 73% of HIV-negative mothers were informed of the advantages of exclusive breast-feeding, only one of 34 HIV-positive mothers was informed about the possible side-effects of nevirapine, and none was told what to do when they occurred. The study proposed that poor quality of counselling in the PMTCT programme will reduce the effectiveness of PMTCT services.

A study on dynamics and constraints of early infant HIV infection in rural Kenya identified that service providers and caregivers had inadequate training, knowledge and understanding of early infant diagnosis, and were not sure of the number, exact time points or type of tests to be done (Amin et al., 2012). The training needs assessment for clinicians at antiretroviral therapy (ART) clinics in Uganda (Lutalo et al., 2009) confirms that midwives' overall knowledge of ART was insufficient. Suggestions were made that training initiatives should be an integral part of the support for task-shifting, ensure that ART therapy is used correctly and that toxicity or drug resistance do not reverse accomplishments to date (Lutalo et al., 2009).

In South Africa implementation of the 2008 national PMTCT policy required competent nurses and midwives to roll out the management of antiretrovirals (ARVs)/ART (Department of Health, 2008), and there was an urgency to train nurses and midwives in PMTCT. Based on these requirements, in 2008 PMTCT competency-based training course materials were developed and integrated into the undergraduate third-year of midwifery programme with the aim of producing professional nurses competent in four areas of PMTCT: counselling and HIV testing, ARV/ART management, infant-feeding option management and polymerase chain reaction (PCR) tests for infants, and contribute to improvement in PMTCT services.

The study aimed to assess the adequacy and sustainability of the PMTCT training course materials integrated in the undergraduate midwifery programme, and the pre- and post-training attitudes of the professional nurses.

## **Methodology**

A quantitative research design was employed to conduct the study. Quantitative research is about explaining the relationship between variables using statistics. The settings of the study were the Cape Town Metro and Overberg districts. The Metro district has eight sub-districts, five regional hospitals, nine district hospitals, nine community health centres, 37 community day centres and 11 maternity obstetric units, while the Overberg district has four district hospitals

and one community health center. The study also included one university in the Western Cape and nursing colleges in the Eastern Cape.

The study population was classified into two categories. The first category included those who trained in PMTCT competencies and are currently doing community services. About 158 professional nurses and midwives were doing their community service in 2013. The second category of study participants comprised lecturers and clinical supervisors involved in teaching nursing and midwifery courses at the university and colleges.

De Vos, Strydom and Delpont (2002) guideline for sampling was used to calculate the sample size. According to the sampling guideline a sample size of 38.5% of the total population of 158 was 60, and the confidence interval was at 95%. The total population for the sustainability study comprised lecturers and clinical supervisors from a university in the Western Cape and nurse educators nursing colleges in the Eastern Cape. This was a 100% sampling technique and the sample size for the second category was 40 participants.

Questionnaires were developed on the study variables. The questionnaires consisted of four sections. The first section contained socio-demographic information; the second contained questions related to adequacy of the training materials integrated into the existing courses, the third section focused on sustainability of the integration of PMTCT courses in the undergraduate nurse-midwife training programme, and the fourth section was about pre- and post-training attitudes of the respondents. All questionnaires were prepared in the English language as all participants spoke and wrote English language proficiently. Pilot testing was conducted and the necessary adjustments were made to the questionnaire based on the results of the pilot testing. The questionnaires were distributed to the participants to be completed, and completed questionnaires were collected within two weeks time.

The first category of data was analysed using SPSS software programme version 21, and the second category of data was analysed using SAS version 9. This was done in consultation with a statistician. The completed questionnaires were first coded, cleaned and double-entered into Excel to check for any discrepancies before analysis. For the descriptive analysis frequency distributions were generated for all categorical variables. Median and standard deviations were also generated for the quantitative data variables.

Reliability is the consistency with which the measuring instrument must deliver consistent and repeatable results (Creswell, 2009). In this study, reliability was ensured through using the comprehensive literature review to develop a robust data collection instrument and the questionnaires were adopted partially from questionnaire developed by Taylor-Powell and Renner (2009) at the University

of the Wisconsin to collect evaluation data. Validity is concerned with the effectiveness and accuracy of the instruments (Burns & Grove, 2011). The face validity, content validity and construct validity were confirmed by the pilot testing. External validity was ensured based on the extensive literature review that was undertaken in order to develop a conceptual model for the study, instruments and pilot testing.

In this study the participants' privacy and dignity were respected; their judgements and opinions remain strictly anonymous (Babbie, 2001). The study received ethical approval from the university and Department of Health. Participants were informed that participation to the study was voluntary and were given detailed information to ensure full understanding of the implications of participation. The participants were informed they had the right to withdraw from the study at any time. The written consent form was signed by participants and it was ensured that information obtained from them was kept anonymous.

## **Results**

### *Profile of respondents*

Out of the 100 survey questionnaires distributed, a total of 72 were completed and returned. A total of 67 completed survey questionnaires were used for the analysis, thus giving a response rate of 76.7%. Five completed questionnaires were discarded due to errors in completion.

The median age range for the first group (lecturers and clinical supervisors) of respondents was 40–49 years. Ninety-six per cent were women and the rest were male. The median educational achievement indicated that the majority (84.85%) have a postgraduate diploma in nursing, and 12.12% have a B.A. degree in nursing. The rest have a diploma in nursing. The extent of work experience ranged from 3 to 26 years; the median work experience was 8 years and the category with a cumulative percentage a little more than 50. More than 87% of the respondents have taken HIV/AIDS training, and 84% PMTCT training. About 84.9% of the respondents have completed both HIV/AIDS and PMTCT training, while 12.12% and 15.15% did not have training on HIV/AIDS and PMTCT respectively.

The age range for the second group (professional nurses doing community service) was 20–29 years (76.2%), and about 23.5% of the respondents were 30–39 years of age. The highest level of education achieved was a B.A. degree in nursing (80%), and 17.6% have a postgraduate degree. Approximately 62% of the respondents have completed in-service training on HIV/AIDS and PMTCT, whereas about 35% of the respondents had not attended in-service training.

*Adequacy of PMTCT training materials*

The results of part two, addressing the adequacy of the integrated PMTCT course materials in the undergraduate nurse-midwife programme, are presented in Table 1. Approximately 62% of participants have attended in-service training workshops on HIV/PMTCT while 35.3% have not yet attended. Adequacy of the course was determined by the responses of ‘very adequate’ or ‘fairly adequate’.

**Table 1:** Information on adequacy of PMTCT training course materials

	PICT/ HCT course		PICT/ HCT video		ART course		ART video		PCR testing course		PCR testing video		INF OP course		INF OP video	
	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%
Not adeq.	0	0	2	5.9	0	0	2	5.4	2	5.9	2	5.9	0	0	2	5.9
Some- what adeq.	0	0	5	14.7	1	2.9	1	2.9	0	0.0	5	14.7	0	0	6	17.6
Fair-ly adeq.	20	58.8	23	67.6	22	64.7	17	50	14	41.2	15	44.1	9	26.5	8	23.5
Very Adeq.	14	41.2	4	11.8	11	32.4	14	41.2	18	52.9	11	32.4	25	73.5	18	52.9
Tot-al	34	100.0	34	100.0	34	100.0	34	100.0	34	100.0	34	100.0	34	100.0	34	100.0

PICT = provider-initiated counselling and testing; HCT = HIV counselling and testing; INF OP = Infant-feeding option; Adeq. = adequate; F = frequency.

Participants responded that PICT (provider-initiated counselling and testing)/HCT (HIV counselling and testing) lecture materials provided were very adequate (59%) and fairly adequate (41.2%). HIV/AIDS skills provided by watching a video were very adequate (11.8%) and fairly adequate (67.6%) to provide counselling to HIV/AIDS-positive pregnant women. About 6% of participants reported that the PMTCT course materials were not adequate. For ARV/ART courses provided, the participants responded that they were very adequate (32.4%) and fairly adequate (64.7%). Video material on ARV/ART was regarded as very adequate by 41.2% and fairly adequate by 50%. About 5.4% of the participants responded that the ART video was inadequate.

The PCR testing course involves the techniques of conducting the test and interpreting the laboratory result. The PCR lecture course material was found to be very adequate by 52.9% and fairly adequate by 41.2%. There were 5.88% who reported that it was not adequate to provide them with knowledge on PCR testing and interpretation. The video material provided on PCR testing skills was regarded as very adequate by 32.4% and fairly adequate by 44.1%, while 14.7% responded that it was somewhat adequate and 5.9% that it was not adequate.

The lecture course materials provided on infant-feeding options management were scored very adequate by 73.5% and fairly adequate by 26.5%. All participants indicated that the course material for infant-feeding options

management for HIV-exposed babies enabled them to gain adequate knowledge that they used in their practical situations. The video materials on infant-feeding options management skills were regarded as very adequate by 53% and fairly adequate by 23.5%, with 17.6% regarding them as somewhat adequate and 5.9% as not adequate. Infant-feeding option management counselling and decision making with HIV-positive pregnant women requires a great deal of thinking and consideration on the part of the mother. Sometimes decision making involves other people because of all of the cultural and social issues concerned. Thus the infant-feeding options management counselling for PMTCT clients should start early during the antenatal period so that by the time the baby is born the mother has already made her decision on this.

*Sustainability of integrated PMTCT training course materials*

Table 2 shows the results for sustainability of the integrated PMTCT course materials. Regarding sustainability of the integrated PMTCT course materials, the related question asked was how likely were the course materials to be excluded from the undergraduate midwifery programme? The majority of participants responded that it was either very unlikely or unlikely (Table1). In order to assess the adequacy of the PMTCT training course materials, the questions asked were how adequate the course materials were for acquiring knowledge, skills and attitudes in PMTCT. Most of the participants responded that they were either very adequate or fairly adequate for this purpose (Table 2).

**Table 2:** Sustainability of PMTCT training course materials

PICT/ HCT	ART management				PCR				Infant-feeding options Management										
	F	%	CF	C%	F	%	CF	C%	F	%	CF	C%							
1	1	3.03	1	3.03	1	2	6.06	2	6.06	1	2	6.06	2	6.06	1	3.03	1	3.03	
2	2	6.03	3	9.09	3	11	33.33	13	39.39	2	2	6.06	4	12.12	2	1	3.03	2	6.06
3	10	30.30	13	39.39	4	20	60.61	33	100.0	3	16	48.48	20	60.61	3	9	27.27	11	33.33
4	20	60.61	33	100.0						4	13	39.39	33	100.0	4	22	66.67	33	100.0

F = frequency; CF = cumulative frequency; C% = cumulative percentage.

As indicated in Table 2, more than 90% of the respondents agree that the integrated PMTCT counselling course is sustainable. The median for this response was 4 at 60.61%; the category with cumulative percentage was lower than 50. In terms of whether it was likely that course materials would be excluded from the undergraduate third-year nurse-midwifery programme, the participants responded for PICT/HCT material that it was very unlikely (60.61%) and unlikely (30.30%), and for ART course material very unlikely (60.61%), and unlikely (33.33%). Only 6% of them stated that it was very likely that the course could be excluded from the nursing programme after the end of the project. On PCR testing responses were that it was very unlikely (39.39%) and unlikely (48.48%). The medial response was 4 at 66.67%. Almost 94% of the respondents stated that the infant-feeding options management course is sustainable, saying

that it was very unlikely (66.67%) and unlikely (27.27%) to be excluded from the undergraduate third-year nurse-midwifery programme.

*Attitudes about HIV-positive pregnant women*

The participants reported that prior to the PMTCT training course their attitudes toward HIV- positive pregnant women was that they were fearful (32.4%); negative (12%); positive (26.5%); and helpful (20.6%)(Table 3).

**Table 3:** Attitude towards HIV-positive pregnant women prior to PMTCT training

<b>Attitude prior to PMTCT course</b>	<b>Frequency</b>	<b>%</b>
<b>Negative</b>	4	11.8
<b>Fearful</b>	11	32.4
<b>Indifferent</b>	3	8.8
<b>Positive</b>	9	26.5
<b>Helpful</b>	7	20.6
<b>Total</b>	34	100.0

After PMTCT training approximately 55% reported that their attitudes towards HIV-positive pregnant women were positive, 42% indicated that they were helpful, and 3.2% that they were fearful (Table 4).

**Table 4:** Post-PMTCT training attitude towards HIV=positive pregnant women

<b>Attit. after PMTCT course</b>	<b>Frequency</b>	<b>%</b>
<b>Negative</b>	0	0.0
<b>Fearful</b>	1	3.2
<b>Indifferent</b>	0	0.0
<b>Positive</b>	17	54.8
<b>Helpful</b>	13	41.9
<b>Total</b>	31	100.0

**Discussion**

The findings of this study confirmed the adequacy of the PMTCT training materials integrated into the undergraduate midwifery programme. The PMTCT training materials include the class lectures, lecture notes, textbooks, videos, skills laboratory and other reading materials related to the course. The professional nurses indicated that the training material courses had been relevant for practical application and enabled them to perform with confidence during their clinical activities. Adeogun (2001) asserts that learning is strengthened when there are enough material resources.

Most of the professional nurses rated the adequacy of the lecture and video training materials as fairly adequate or very adequate. Adequacy of the videos refers to specifically watching the skills demonstrated in four competency areas: HCT, ART, PCR test techniques and infant-feeding options management. Before the trainees start with the guided and independent practice in a simulated area, they need to watch the skills on videos.

The PMTCT competency-based training was increasingly emphasised as fundamental for the reduction of mother-to-child HIV transmission (Mbombo & Bimerew, 2012). More than 80% of participants indicated that they have adequately implemented the knowledge and skills on PMTCT that they acquired during their third-year midwifery courses. The findings of this study are in line with those of Adeogun (2001), who showed a strong relationship between adequacy of training materials and academic performance. Babayomi (1999) noted that adequacy of teaching and learning resources correlates with increased performance. The authors also found a significance improvement in the confidence level of those graduated professional nurses who were doing their community service (Babayomi, 1999).

This study has shown the sustainability of integrated PMTCT training course materials in the undergraduate midwifery programme, and these course materials were regarded as adequate to help equip students with skills and build in-depth knowledge on PMTCT. It may broaden students' understanding of the subject matter within the major midwifery courses. More than 85% of the responses supported the sustainability of the integrated PMTCT course materials. Nevertheless, the findings of the present study should be interpreted in the light of a limited sample size, and the results cannot be generalised to other populations.

The findings of this study are similar to those of Remington and Owens (2009) that infusing courses into traditional courses is more sustainable. The authors further emphasised that education might be most effective if those infused into traditional courses show interconnectedness (Remington & Owens, 2009). The results highlighted that interconnectedness of the PMTCT training course materials with the traditional major midwifery courses demonstrated the sustainability of the course materials. These findings are in line with those of Brundiers and Redman (2010) that competencies-based courses focused on problem solving in the actual real world are more likely to be sustainable.

The aim of integration of PMTCT course materials was to increase students' problem-solving skills through engagement with practical real situations and challenges in PMTCT services. Coming up with sustainable integrated courses should begin at the design phase and continue until the product reaches to its end life, and even thereafter (Kalla & Brown, 2012).

This type of PMTCT competency-based training is the first of its kind at school of nursing, University of the Western Cape and could be used as a benchmark in other areas where the study could be replicated and the materials used and measured. The PMTCT competency-based training was developed based on the current demand and requirements for professional nurses to manage PMTCT clients, including the management of ART. Traditionally the administration and management of ARV/ART drugs was done only by doctors; however, this was practically impossible in the rural areas, where all health care facilities are run by professional nurses alone. In this regard it was a societal and situational demand to train nurses in PMTCT competency for feasibility of implementation of the 2008 PMTCT national policy that directed nurses to administer and manage ART drugs in South Africa.

As the results of this study has indicated, the adequacy of the PMTCT training materials could also inform the need to maintain the sustainability of the integrated course materials. How these course materials were integrated throughout the midwifery programme was clearly explained in a previous article by Mbombo and Bimerew (2012). Producing efficient and competent professionals not only increases productivity, but also minimises the stress level of the work, and more importantly reduces mother-to-child HIV transmission (Mbombo & Bimerew, 2012). In terms of the impact of the project, the findings suggest that apart from the small sample size, more adequate responses obtained determined that the current remarkable reduction in mother-to-child transmission was a result of such types of adequate PMTCT training and of equipping professional nurses with knowledge and skills to deal with HIV/AIDS and PMTCT problems.

Our findings on attitudes towards HIV-positive pregnant women pre- and post-PMTCT training indicated an improvement in respondents' attitudes after the PMTCT training. In comparing the pre- and post-PMTCT training attitudes, the highest score pre-training was fearfulness at 32.4%, followed by positive (26.5%) and helpfulness (20.5%) and negative attitudes towards HIV-positive pregnant women (11.8%); after training the score for fearfulness towards HIV-positive pregnant mothers was significantly reduced to only 3.2%, and there was a zero score for negative attitudes. The positive and helpfulness attitude scores were more than doubled at 54.8% and 41.9% respectively. The results of this study confirm the adequacy of the PMTCT training materials in improving the attitudes of professional nurses.

## **Conclusion**

This study examined the adequacy and sustainability of the PMTCT competency-based training course materials integrated in the undergraduate midwifery programme, and confirmed that these integrated course materials were adequate and sustainable. The course will continue to be offered at the school in order to build PMTCT-competent professional nurses. It has a significant impact on the practical experiences of the professional nurses in the area of PMTCT services.

The training of nurses in PMTCT competencies has contributed enormously to the reduction of mother-to-child HIV transmission. These courses are well aligned with the traditional major midwifery courses, which prepare students with PMTCT knowledge and skills for the real, practical world. However, one should understand the dynamics of the curriculum, and the consideration should be kept in mind that the curriculum always changes, or the administration could also be changed, which may affect the continuity of the integrated course materials. Such unforeseen circumstances are unavoidable, and are a threat.

The rationale obtained from the results of this study suggests that a PMTCT competency-based training course should be incorporated in all levels of undergraduate nursing programmes, including those at other nursing training institutions. Further research with larger sample sizes should focus on assessing competence development in sustainability interventions for PMTCT courses in traditional disciplinary midwifery courses.

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