

Assessing Challenges Faced by Nurses in Delivering Prevention of Mother to Child Transmission of HIV/AIDS Services in Buea Health District, Cameroon

Samuel Nambile Cumber^{1, 2, *}, Munongo Gyengsi Yvonne², Rosaline Yumumkah Kanjo Cumber^{2, 3}, Tabi-Arrey Victory-Noel Maojong²

¹Discipline of Public Health Medicine, Department of Nursing & Public Health, College of Health Sciences, University of Kwazulu-Natal, Durban, South Africa

²Under Privileged Children and Women Assistance (UPCAWA-SWEDEN), Buea, Cameroon

³Department of Political Science, University of KwaZulu-Natal, Durban, South Africa

Email address:

samuelcumber@yahoo.com (S. N. Cumber)

*Corresponding author

To cite this article:

Samuel Nambile Cumber, Munongo Gyengsi Yvonne, Rosaline Yumumkah Kanjo Cumber, Tabi-Arrey Victory-Noel Maojong. Assessing Challenges Faced by Nurses in Delivering Prevention of Mother to Child Transmission of HIV/AIDS Services in Buea Health District, Cameroon. *Journal of Family Medicine and Health Care*. Vol. 2, No. 4, 2016, pp. 65-73. doi: 10.11648/j.jfmhc.20160204.17

Received: September 14, 2016; **Accepted:** October 12, 2016; **Published:** November 23, 2016

Abstract: HIV/AIDS is a major global public health concern Worldwide over 40 million people are estimated to be infected with 28 million people from Sub-Saharan Africa at the end of 2001. This is the region with the highest prevalence. This study was carried out in the Buea Health District of the South west region Cameroon. Was a descriptive cross sectional study design. A convenient sampling method was used for this study where in the nurses on duty who agreed to fill the questionnaires. A sample size of 60 was targeted, 20 was disqualified. Data was analyzed using SPSS version 16 and is presented on table and charts. Nurses are unable to identify neither all the roles of the nurse in PMTCT nor all the package of activities of the PMTCT program (identify women with HIV for example). However, they were very knowledgeable on MTCT and the effects of HIV on children. They identified some challenges they faced in two main areas; remuneration and poor collaboration between nurses and clients. From their responses a number of challenges were deduced as well. It was then concluded that nurses in the Buea health district do face challenges in delivering PMTCT services. Therefore the null hypothesis was then discarded and the alternate hypothesis adopted that nurses do face challenges in delivering PMTCT services. These challenges need to be addressed so that vision of zero incidence of HIV in new born could be achieved for an AIDS free world.

Keyword: Nurses, Prevention, Mother, HIV, Transmission, Cameroon

1. Introduction

Prevention of mother to child transmission of HIV/AIDS (PMTCT) refers to a comprehensive management approach aimed at the well being of all women of reproductive age, provision of HIV screening for all women, prevention of new infections among infants born to HIV positive mothers and management of HIV positive mothers. [1] This program was born following the increase prevalence of infant mortality, with HIV ranked as the fifth cause. 90% of HIV infection in children is transmitted from mother to child (vertical

transmission) during pregnancy, labour, delivery and breastfeeding. [2, 3] Without treatment, antiretroviral therapy (ART) the likelihood of HIV passing from mother to child is 15-45%, 5-10% during pregnancy, 10-20% during labour and delivery and 10-20% during breastfeeding. [3-5]

PMTCT programs require women and their infants to receive a cascade of interventions including uptake of antenatal services and HIV testing during pregnancy, use of ART by pregnant women living with HIV/AIDS, safe child birth practices and appropriate infant feeding, uptake of infant HIV testing and other post-natal healthcare services. [6, 7] MTCT rate is less than 1% through perinatal

prevention of MTCT in high income countries. [8, 9]

In low income and middle income countries, PMTCT program coverage remains low and consequently transmission rate high. [10, 11] In Cameroon for example with a population of 19.9 million as at 2006, Cameroon faces one of the most severe HIV epidemics in west and Central Africa. Adult prevalence rated at 4.3%, about 610,000 people live with AIDS and 37,000 died from AIDS in 2009. Here women are disproportionately affected; prevalence of 5.6% versus 2.9% in men. Approximately 54,000 children under 14 years of age are infected and a staggering total of 330,000 children loss at least a parent to AIDS. [12]

In 1986, the government of Cameroon responded to the HIV epidemic by creating the National AIDS Control Committee (NACC) with a national goal of virtual elimination of MTCT by 2015 as targeted in the 2009-2015 national strategic plan and the Cameroon national plan to eliminate new HIV infections in children and keep mothers alive. [11-13] In 2011 a global plan was launched to reduce the number of new infections through MTCT (PMTCT) by 90% by 2015. [2, 7]

Prevention of Mother to Child Transmission programs in Sub-Saharan Africa have already suffered a defeat owing to the gap between global politics and local realities. [14] Over the last four decades the knowledge of HIV/AIDS has increased and so have the number of people affected. [15] In 2003 alone, 590,000-810,000 children were newly infected with HIV, nearly always through MTCT and currently close to 90% of pediatric infections occur in Sub-Saharan Africa. Worldwide 2.5-3.5 million children die AIDS related deaths, this causes shortfalls in the achievements of the 4th and 5th millennium development goals. [16] The prevalence of pediatric HIV continues to be on the rise inspite so much national and international efforts. For these reasons, the investigators felt the need to assess the challenges faced by nurses in eliminating MTCT of HIV/AIDS.

The main objectives for this study was to assess the challenges faced by nurses in delivering PMTCT services; to assess knowledge of nurses in the Buea Health District on MTCT of HIV/AIDS; to investigate knowledge of nurses in the Buea Health District on PMTCT of HIV/AIDS; to find out the challenges they may face in delivering PMTCT services.

The study asked questions such as, Are nurses in Buea Health District knowledgeable on MTCT of HIV/AIDS?; Are nurses in Buea Health District knowledgeable on PMTCT programs?; Do nurses in Buea Health District face any challenges in delivering PMTCT services?

Nurses of the Buea Health District do not face challenges in delivering PMTCT services was the main hypothesis drawn for this study.

This study will assist subsequent researchers and serve as a reference point. It has improved the knowledge base of the investigators. It served as a refresher for the study participants.

This research is contributing to the attainment of

millennium development goals 5 in the fight against child and maternal mortality in that should the challenges faced by nurses are known, solutions will be sort and implemented.

It will help identify the felt need and the real needs of nurses working with PMTCT delivery units.

It may bring about a solution to solve the problem responsible for the poor uptake of PMTCT program in Buea Health District and possibly Cameroon (at large) by extension.

2. Methods and Materials

2.1. Study Area

This study was carried out in the Buea Health District of the South west region Cameroon. The district has 6 health areas and 29 health structures excluding pharmacies. The health facilities are owned by the Government, the missions and individual private owners.

2.2. Scope of Study

This study was focused mainly on MTCT of HIV/AIDS and the challenges faced in carrying out PMTCT services.

2.3. Definitions

Vertical transmission; infections caused by bacteria, viruses, and parasites transmitted directly from mother to embryo, fetus or baby during pregnancy or childbirth (Stedman's medical dictionary, 2009).

Baby friendly facility: a maternity that also acts as a centre for breast feeding support. It is an initiative of UNICEF in 2013 and WHO in 2013.

2.4. Study Design

A descriptive cross sectional study design was used for the research.

2.5. Study Population

The study population included nurses within the Buea Health District who work in the labour room, post natal ward, ANC, IWC, and family planning units

2.6. Sampling Method

A convenient sampling method was used for this study where in the nurses on duty who agreed to fill the questionnaires were each given one.

2.7. Sample Size

A sample size of 60 was targeted, 5 questionnaires were disqualified, and 11 were unattended to, and 6 got lost and we were left with 40 correctly filled questionnaires.

2.8. Pre Testing

Questionnaire was pre tested in Kotto Bassa Health Area, and the necessary corrections adopted thereafter.

2.9. Data Collection

A questionnaire structured in four sections was used for this study and the sections include; Demographic data;

- Knowledge on MTCT
- Knowledge on PMTCT
- Challenges nurses face in delivering PMTCT services

2.10. Data Analysis

Data was analyzed using SPSS version 16 and is presented on table and charts. From analysis, the P-value is 0.029, ($P = 0.029$) which is statistically significant since it is less than 0.05.

2.11. Ethical Consideration

Haven obtained an autorisation document from the school (HIAMS) with which we used to get the permission letter from the Regional Delegate For Public Health, letters addressed to the heads of the various health facilities attaching the documents from the school and regional delegate to request permission to carry out research. Upon acceptance respondents were then informed of the benefits of the study and informed consent was ensured by them signing the consent form.

2.12. Inclusion and Exclusion Criterion

Nurses at the Buea health district who worked at the maternity, IWC, ANC, and family planning units.

Nurses who did not work at the maternity, ANC, IWC, Family planning units were excluded from the study.

3. Results

3.1. Demographic Data

3.1.1. Distribution of Respondents According to Level of Education

Table 1. Showing the frequency of respondents according to level of education.

Level of Education	Frequency	Percentage (%)
Assistant nurse	15	37.5
State enrolled nurse	10	25
HND/SRN	7	17.5
Bachelor	8	20
Others	0	0
Total	40	100%

This survey reveals that 37.5% of the nurses were assistant nurses, 25% were state enrolled nurses, 17.5% had Higher National Diplomas (HND) and 20% had bachelor degrees.

3.1.2. Distribution of Respondents According to Years of Working Experience

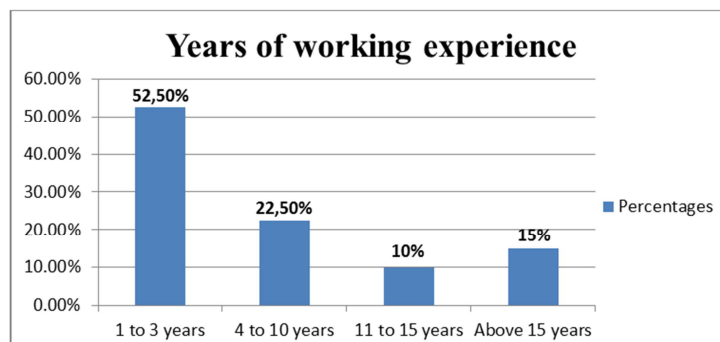


Figure 1. Bar chart showing distribution of respondents according to working experience.

This research showed that, 52.5% of the nurses had between 1-3 years of working experience, while 22.5% had 4-10 years, also 10% had 11-15 years and 15% had above 15 years of working experience.

3.1.3. Distribution of Respondents According to Years of Experience Working on PMTCT Program

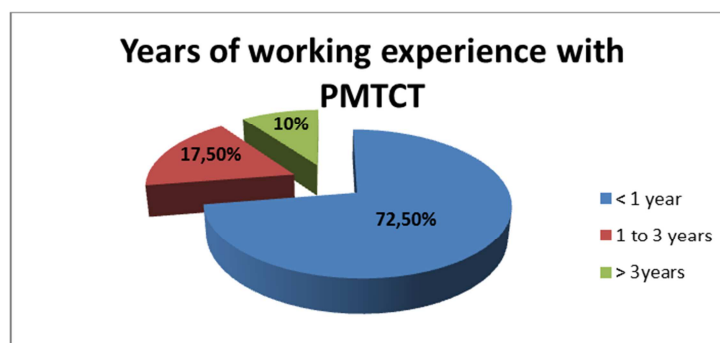


Figure 2. Pie chart showing distribution of respondents according to working experience with PMTCT.

With respect to years of working experience of the nurses on PMTCT, this work showed that 72.5% of them had 1 year experience, while 17.5% have 1-3 years of experience and 10% of them had more than 3 years of experience in PMTCT.

3.1.4. Distribution of Respondents According to the Type of Institution They Work for

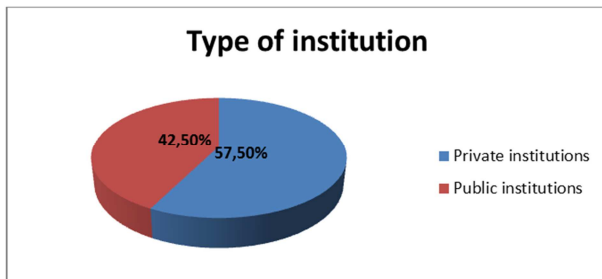


Figure 3. Pie chart showing distribution of respondents according to type of institutions.

Also with regards to the type of institution, this survey showed that 57.5% of the nurses worked in private institutions while 42.5% of them worked in public institutions.

3.1.5. Distribution of Respondents According to the Location of Institution

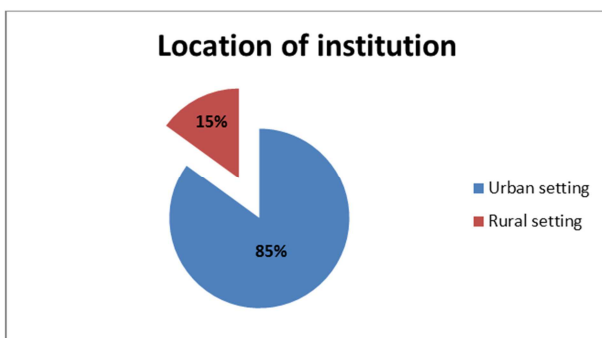


Figure 4. Pie chart showing distribution of respondents according to the location of health facility.

This research work also shows that 85% of the 40 nurses interviewed work in urban settings while 15% of them work in rural settings.

3.2. Knowledge on Pmtct

3.2.1. Distribution of Respondents According to Ability to Identify All the Nurses' Roles in PMTCT

Table 2. Showing distribution according to capacity to identify all nurses' roles in PMTCT.

Description	Frequency	Percentage (%)
Could identify all nurses' roles in PMTCT	6	15
Could not identify all nurses' roles in PMTCT	34	85
Total	40	100%

3.2.2. Distribution of Respondents According to Knowledge on Counsel Given to an HIV Positive Woman Who Wants to Get Pregnant

Looking at the ability to identify all nurses' roles in PMTCT, this study showed that 15% of the nurses could identify all nurses' roles while 85% couldn't identify all nurses' roles in PMTCT.

3.2.3. Distribution of Respondents According to Responses of Attitude of Pregnant Women Towards PMTCT

This study shows that 45% of the pregnant women are aggressive towards PMTCT, 45% are cooperative with the nurses while 10% are indifferent as seen in the figure below;

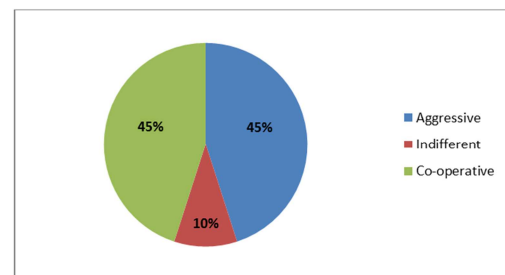


Figure 5. Distribution of respondents according to their view on client co-operation.

3.2.4. Distribution of Respondents According to Ability to Identify All the Components of PMTCT

With respect to identifying the components of PMTCT, this studies show that 100% of the nurses could identify all the components of PMTCT. This is represented in the table below;

Table 3. Distribution of respondents on ability to identify the components of PMTCT.

Description	Frequency	Percentage (%)
Could identify all the components of PMTCT	0	0
Could not identify all the components of PMTCT	40	100
Total	40	100%

3.2.5. Distribution of Respondents According to Knowledge on Baby Friendly Facility

This research also reveals that 100% of the nurses have knowledge on baby friendly facility. This is shown in the table below;

Table 4. Distribution of responses on the knowledge on baby friendly facility.

Description	Frequency	Percentage (%)
Yes	0	0
No	40	100
Total	40	100%

3.3. Challenges Faced Working with Pmtct

3.3.1. Distribution of Respondents According to Like or Dislike Working with HIV Positive Mothers and Their Children

This study shows that 40% of the nurses like working with

HIV infected mothers and children while 60% dislike working with them. This is seen in the figure below;

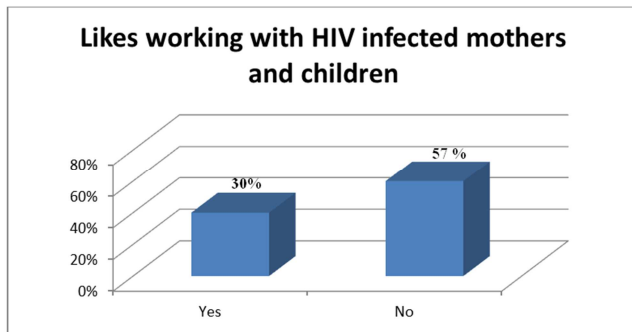


Figure 6. Distribution of responses according to likes or dislikes working with HIV positive women and children.

3.3.2. Distribution of Respondents According to Frequency of Accidental Exposures

This survey shows that 60% of the nurses confirmed that the frequency of accidental exposures occur often while 40% of them said the frequency hardly occurs. These results are represented in the figure below;

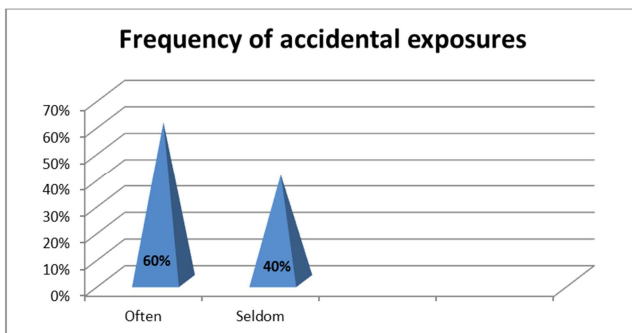


Figure 7. Distribution of responses on the frequency of accidental exposures.

3.3.3. Distribution of Respondents According to Special Training Received to Work on PMTCT

According to the responses on special trainings received on PMTCT by the nurses, this research examined that 80% of the nurses accepted they have received adequate trainings on PMTCT while the remaining 20% of them said they have not received training on PMTCT. This is seen in the figure below;

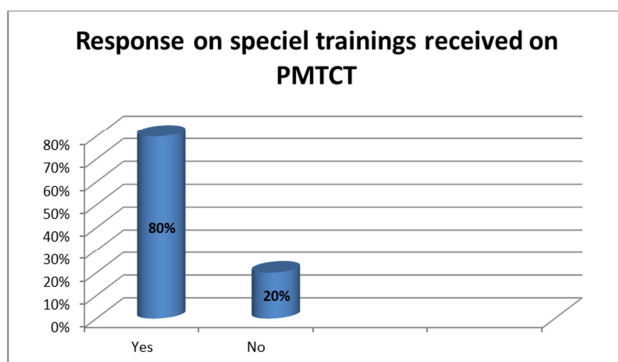


Figure 8. Distribution of respondents according to special trainings on PMTCT.

3.3.4. Distribution of Respondents According to Frequency of Attending Seminars on PMTCT

This studies shows that 47.5% of the nurses they rarely attend seminars on PMTCT, 40.5% of them said they often attend the seminars, while 10% of them said they very often attend seminars on PMTCT as seen in the figure below;

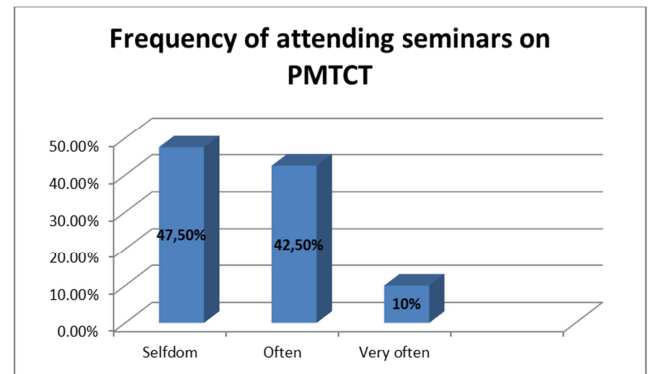


Figure 9. Distribution of respondents according to the frequency of attending seminars on PMTCT.

3.3.5. Distribution of Respondents According to If or not They Face Challenges

Based on the challenges faced by the nurses, this research reveals that 100% of them face challenges as seen in the table below;

Table 5. Distribution of responses on challenges faced by the nurses.

Challenges	Frequency	Percentage (%)
Yes	40	100
No	0	0
Total	40	100%

3.3.6. Distribution of Respondents According to Their Challenges Which They Identified

This research work shows that 82.5% of the nurses said their major type of challenge they face is inadequate salaries/ remuneration while the other 17.5% of them said it's due to poor collaboration from clients/ patients. This is represented in the figure below;

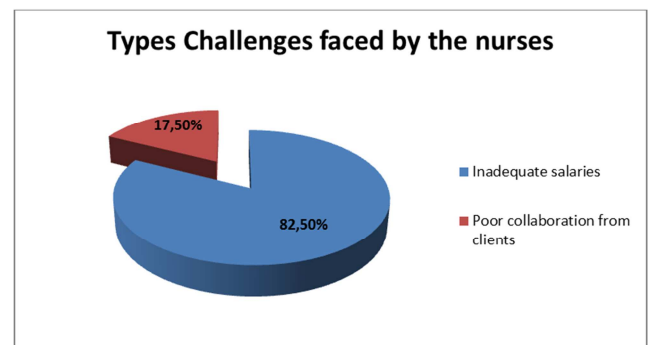


Figure 10. Distribution of responses according to the types of challenges faced.

4. Discussion

Based on the knowledge of MTCT, 100% (40) of the study participants showed sound knowledge of MTCT being able to identify all means by which HIV can be transmitted from mother to child. Based on the knowledge of PMTCT all participants (100%) responded to have knowledge on what PMTCT is, although none of them could identify all the roles the nurses have to play in PMTCT. This fact may already indicate a reason for a challenge as they carry out PMTCT services. Also, none of them could identify all the package of activities of PMTCT as laid down by WHO. [7, 12]

Majority of the respondents 19 (47.5%) of respondents reported to seldom attend seminars on PMTCT and this can explain why none of them could identify all the roles of the nurse in PMTCT nor all the packages of the PMTCT program. Furthermore, 62.5% (25) of study respondents responded "I don't know" as to what counsel to give to an HIV positive woman who wants to get pregnant and as concerns infant feeding 40 (100%) respondents responded they would counsel artificial feeds in respect with the AFASS principle which is the current protocol for feeding infants exposed to HIV. This is similar to a study carried out in Tanzania by Msuya, which revealed that 92% of the correspondents could not help Mothers living with HIV adopt a feeding plan for their infants. [10]

Based on participants challenges faced all 40 (100%) of respondents said "Yes" to facing challenges in their job and they identified two challenges grouped in this two areas; remuneration and poor collaboration between nurses and clients. As per poor collaboration, 45% of respondents stated that clients are aggressive, and 10% stated that pregnant women were indifferent towards PMTCT activities. This is in line with a research by Unyango, in Uganda which found out that 60% of its study respondents reported that pregnant women refuse to be tested and would not comply with treatment and that nurses reported that follow up of HIV positive women was a big challenge to PMTCT in Uganda. [17]

According to Abou and Grents, as well some of the barriers to PMTCT are clients related and include knowledge about HIV, MTCT and PMTCT, knowledge on HIV status among others and it states that if pregnant women are knowledgeable on MTCT, PMTCT, and HIV/AIDS they will comply with PMTCT activities better. [2]

Another challenge the nurses of Buea health district face with delivering PMTCT services is that they do not derive job satisfaction as 24 (60%) of respondents reported not to like their job and this can be justified and 40 (100%) of respondents reported that they are not rightly paid for the job this as well is justified by the high percentage of nurse assistance 37.5% working in the program and in a country like ours which pays its employees based on their level of education and not on the amount of work done. It is also backed by the fact that 57.5% of the respondents work in private hospitals which is known commonly not to pay its workers well. This is in line with Uyango of Uganda's study wherein 75% of study participants raised concerns with

maintaining staff morale as a challenge facing the uptake of PMTCT in the Northeastern part of the country. [17]

Evidence as to why the respondent's do not get job satisfaction is the fact that 60% of the respondents reported to often have accidental exposures. A comparison of both studies shows that the main challenge faced in Uganda is that of materials as identified by the study participants (100%) unlike the study participants of this study (100%) who indicated poor remuneration as their main challenge.

Based on the investigators observation other challenges in these areas;

- Infrastructure: the buildings are small making handling of equipments challenging and work space is space. This causes stress at work, reduces efficiency and it may have an effect on work output.
- Retraining: PMTCT is gaining much of the world's attention now, new and better practices are being introduced and there is need to relate research results to practice.
- Inadequate personnel: There are limited trained personnel to handle certain responsibilities as more nurse assistants are recruited and handed such big responsibilities.
- Poor maintenance of equipment: a lot of spoilt and abandoned equipments were discovered in the health facilities.
- Public structures (government owned) had a PMTCT unit headed by a nurse who frequently attends seminars on PMTCT unlike with the private structures.
- Work load: one or two or three persons are placed in charge of all the package of activities of PMTCT with little or no assistance from the other staff, causing much work load stress.
- The curriculum of training nurses does not lay adequate emphasis on PMTCT.

5. Conclusion

This research aimed at assessing challenges faced by nurses in delivering PMTCT service in Buea Health District. A null hypothesis was stating that "nurses of the Buea health district did not face any challenges in delivering PMTCT services". Based on the objectives stated in chapter one a questionnaire was designed and 40 respondents recruited for the study using a convenient sampling method. The results obtained are presented in chapter four on tables and charts. The following conclusions were drawn from these ; based on the knowledge on PMTCT, nurses are unable to identify neither all the roles of the nurse in PMTCT nor all the package of activities of the PMTCT program (identify women with HIV for example). However, they were very knowledgeable on MTCT and the effects of HIV on children. They identified some challenges they faced in two main areas; remuneration and poor collaboration between nurses and clients. From their responses a number of challenges were deduced as well. It was then concluded that nurses in the Buea health district do face challenges in delivering

PMTCT services. Therefore the null hypothesis was then discarded and the alternate hypothesis adopted that nurses do face challenges in delivering PMTCT services. These challenges need to be addressed so that vision of zero incidence of HIV in new born could be achieved for an AIDS free world.

Competing Interests

The authors declare no conflict of interest in designing, conducting and reporting the findings of this work.

Recommendations

From the research findings, the investigator recommends

the following;

- The ministry of higher education should include PMTCT as an independent course in the curricula of training schools for nurses.
- Health institutions and NGOs should organize frequent and varied retraining programs for nurses so that, current innovations can be implemented in practice
- Health institutions should look into improving and maintaining staff morale by motivation, provision of adequate working equipments and working space.
- That further research should be conducted in relation to the challenges that pregnant women face in assessing PMTCT services.

Appendix

Questionnaire

Section A Demographic Data

1) Age: 19-23 ☐ 24 ☐ -28 ☐ 29-33 ☐ 34-38 ☐ 39-43 ☐
44-48 ☐ 49-53 ☐ 54-58 ☐

2) Level of education: Nursing Assistant ☐

State Enrolled Nurse ☐

HND/SRN ☐

Bachelor ☐

Others _____

3) Years of experience as a nurse

4) Years of experience working with PMTCT programs

5) Level of health facility: Health center ☐

Integrated Health center ☐

Medicalized Health center ☐

District hospital ☐

General hospital ☐

6) Is the hospital private ☐ or public?

7) Is the health facility located in an urban ☐ or rural setting? ☐

Section B Knowledge on MTCT

1. What is MTCT? _____

2. By what means can HIV/AIDS be transmitted from mother to child?

3. How are children affected by HIV/AIDS?

- High mobility and mortality
- Under growth and under development
- Brain retardation
- No effect

4. Can MTCT be prevented? Yes ☐ No ☐

4b. If yes, how?

Section C Knowledge on PMTCT

1) What is PMTCT?

2) Which is not the nurse's role in PMTCT

- a). Counselor ☐
- b). Care giver ☐
- c). Researcher ☐
- d). Give drugs ☐
- e). Imposes on the patients what is good for them and their babies ☐

3) PMTCT program includes which ones?

- a. Identify women with HIV ☐
- b. Identify pregnant women with HIV ☐
- c. Identify children exposed to HIV ☐
- d. Identify children with HIV ☐
- e. Provide ARVs for people sick with HIV ☐
- f. Provide ARVs for people exposed to HIV ☐
- g. Treatment of STDs and venereal diseases in pregnant women ☐
- h. Advice mothers on good infant feeding practices ☐
- i. Ensure women gives birth in the presence of a health personnel ☐

4) What advice will you give to a known HIV positive woman who wants to get pregnant?

5) What advice will you give to a known HIV positive woman concerning Infant Feeding?

6) How do you consider the attitude of pregnant women towards PMTCT?

- Aggressive ☐
- Indifferent ☐
- cooperative ☐

Section D Challenges faced by nurses in eliminating MTCT

1) Do you face any challenges working with HIV positive women and their babies?

What are some of the challenges you encounter?

Do you like working with mothers and children having and/or exposed to HIV/AIDS?

Yes ☐ No ☐

How many times have you had accidental exposures to HIV/AIDS from them?

Do you feel you are rightly paid for the job?

Yes ☐ No ☐

What do you hate about working in the PMTCT unit?

What do you like about working in the PMTCT unit?

Data Analysis

Test of hypothesis

As stated in chapter three of this work, we will use the Chi square test of significance to test this is seen below:

Table A1. Chi Square Analysis on the relationship between educational level and the challenges nurses face

Description	Observes frequencies	$\frac{(O - E)^2}{E}$
Assistant nurses	15	0.75
State enrolled nurses	10	5
HND/SRN	7	2.77
Bachelor	8	0.40
		$X^2 = 8.92$

$$X^2_c = 8.78$$

$$X^2_{\alpha, (k-1)}$$

$$X^2_{0.05, (4-1)} = 3$$

$$X^2_{0.05, 3} = 7.81$$

From the observations, we can therefore induce that we reject the null hypothesis (H_0) and accept the alternative hypothesis based on the fact that the Chi square value calculated is greater than the cut off value of 7.81 at 5% level of significance that is, $X^2_c > X^2_{\alpha}$ implying the nurses face challenges.

The P-value which is related to the Chi square is the area under the curve of the X^2 distribution with k-1, degree of freedom to the right of the X^2 . From the analysis, the P-value is 0.029 ($P = 0.029$) which is statistically significant since it is less than 0.05.

Acknowledgements

Thanks go to the staffs of the Buea Health District of the South west region of Cameroon. All the health workers and patient who supported this study in different ways. Thanks also goes to UPCAUA - SWEDEN for putting up the research team together and their supports.

References

- [1] Nnam and Brou (2007). Experiences from a Decade of Prevention of Postnatal HIV Transmission in Sub-Saharan Africa". *International Breastfeeding Journal*5 (10).
- [2] Abou and Grents Kantu (2008). "Counting on Mother's Love: The Global Politics of Prevention of Mother-to-Child Transmission of HIV in Eastern Africa". In Hahn R, Inhorn M. *Anthropology and Public Health: Bridging Differences in Culture and Society*. Oxford University Press. p. 449.
- [3] Graham Stein (2000). Prevention of mother to child transmission; *the problems faced by health workers in developing countries*.23 (1): 18–23.
- [4] Abajobir Lee (2013). "Maternal syphilis and vertical perinatal transmission of human immunodeficiency virus type-1 infection". *International Journal of Gynaecology and Obstetrics: the Official Organ of the International Federation of Gynaecology and Obstetrics*63 (3): 246–254.
- [5] Peltzer H Mendez, (June 2015). "Vertical transmission of human immunodeficiency virus (HIV) infection. Reactivity of maternal sera with glycoprotein 120 and 41 peptides from HIV type 1". *J Clin Invest*89 (6): 1923–1930.
- [6] UNAIDS (2004) progress reports of PMTCT.
- [7] WHO (2013) consolidated guidelines on the use of ARV for treating and preventing infections.
- [8] Baxter White, E. (2010). *HIV/AIDS: The Research, the Politics, the Women's Perspectives*. McFarland & Company, Inc., Publishers. p. 12.
- [9] Baumann Kuhn L (2009). "Breast feeding: A time to craft new policies". *J Public Health Policy*30 (3): 300–10.
- [10] Msuya Yu (2009). "Vertical transmission of HIV/AIDS". *Curr Microbiol*.58 (4): 315–320.
- [11] Ekanem Okwi, (2014). MTCT; *Assessing the factors influencing mother to child transmission of HIV/AIDS* in Enugu Nigeria.
- [12] Gross (2014). Definitions and Indicators in Family Planning. Maternal & Child Health and Reproductive Health. By European Regional Office, World Health Organization. Revised March 1999 & January 2001. In turn citing: WHO Geneva, WHA20.19, WHA43.27, Article 23.
- [13] Jayasuriya Fawzi W (2012). "Randomized trial of vitamin supplements in relation to vertical transmission of HIV-1 in Tanzania". *Journal of Acquired Immune Deficiency Syndromes*23 (3): 246–254.
- [14] Maman Oka (2001). PMTCT; *Vertical transmission and the effect on infants*. Page 17, 40.
- [15] Sweeney Feldman, (2005). *Cultural Transmission and Evolution: A Quantitative Approach*. (Mpb-16). Princeton University Press. ISBN.
- [16] Newell Abdel-Fattah (2006). "Pediatric HIV/AIDS and fetal medicine indications: only CMV is necessary in the United Kingdom". *Prenat. Diagn*.25 (11): 1028–31.
- [17] Uyango Kutu (2004). PMTCT; *challenges prevention of mother to child transmission programs in Uganda*. page 34.