

# Knowledge Regarding Human Immunodeficiency Virus and Prevention of Mother to Child Transmission of HIV among a Group of Adults in a Low Income Country

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## Abstract

**Introduction:** Despite communication on Human immunodeficiency virus (HIV), close to 5.9 million people didn't know they were living with HIV. One of the modes of transmission of HIV is vertical transmission. It remains the principal way of transmission of HIV for children below 15 years, with over 90% of them being infected. In Cameroon, the mother and child transmission of HIV is still a problem with 5.5% of infection of exposed infant at the early infant diagnosis in 2019. Awareness on prevention of mother to child transmission (PMTCT) is an important component for the fight against HIV. We therefore aimed at gauging the level of knowledge of a group of adult clients on HIV and PMTCT. **Methodology:** We conducted a cross sectional and analytical study at the Yaoundé Gyneco-Obstetric and Pediatric hospital for a period of one month. Were included, adults who visited the hospital for a free screening campaign on HIV. Data were collected using a questionnaire on their characteristics and knowledge of HIV and PMTCT. Data were entered using CPro and analysed using IBM SPSS. **Results:** There was a gap in knowledge on HIV, considering satisfactory knowledge from 25 points and above, it was noted that 34.6% of our respondents had a non-satisfactory knowledge. For PMTCT, knowledge was average with the majority scoring 10 points on 18. Considering satisfactory knowledge on PMTCT was from 10 and above, 35.9% of our respondents had a non-satisfactory

knowledge. Female sex was associated with satisfactory knowledge for both HIV and PMTCT. Conclusion: Concerning PMTCT, the knowledge of the mode of transmission, Antiretroviral (ARV) drugs for prevention to the babies or feedings recommendations on exposed HIV infants were poor. There is a gap in favor of women regarding knowledge between HIV and PMTCT. Therefore, men are highly encouraged to take part to health promotion activities on HIV and PMTCT.

## Keywords

HIV, PMTCT, Infant, Knowledge

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## 1. Introduction

According to UNAIDS world statistics on HIV, in 2021, 38.4 million people lived with HIV among which 36.7 million were adults (15 years or older) while 1.7 million were children (0 to 14 years) furthermore, 1.5 million people became newly infected and 650,000 died of HIV related illnesses. Despite the importance of these statistics and the massive communication on HIV, 5.9 million people did not know that they were living with HIV [1]. An infected pregnant mother can transmit HIV via the Horizontal and vertical route [2]. Vertical route occurs when the mother transmits HIV to her unborn child during pregnancy and delivery and also during breastfeeding. This is referred to as mother to child transmission (MTCT) [3]. MTCT constitutes the main route of transmission of HIV in children below 15 years with over 90% of them having contracted the virus through this route [3]. Globally, an estimated 1.3 million women and girls living with HIV become pregnant each year. In the absence of intervention, the rate of transmission of HIV from a mother living with HIV to her child during pregnancy, labour, delivery or breastfeeding ranges from 15% to 45%. As such, identification of HIV infection should be immediately followed by an offer of linkage to lifelong treatment and care, including support to remain in care and virally suppressed and an offer of partner services [4]. Prevention of mother to child transmission of HIV programs has prevented approximately 1.4 million new childhood infections and is a major contributor to the elimination of new HIV infections in low and middle-income countries [5]. In Cameroon the PMTCT program is a top priority for the ministry of public health. Like most African countries, vertical transmission of HIV is very high in Cameroun and PMTCT accessibility remains insufficient [6]. Awareness and knowledge on PMTCT by hospital users is an important component of the strategies aiming to reduce HIV/AIDS transmission. However, some clients still do not have a good knowledge on HIV and PMTCT.

Therefore, we aimed through this study, at assessing the level of knowledge of a group of adults who visited the Gyneco-Obstetric and pediatric hospital of Yaoundé on HIV and on PMTCT.

## 2. Methodology

We conducted a cross sectional and analytical study at the Yaoundé Gyneco-Obstetric and pediatric hospital for a period of one month from November 14<sup>th</sup> to December 30<sup>th</sup> 2022. The study population comprised adults who visited the health facility during the study period. The sampling was done by a convenience sampling method. Were included, all adults present at HIV screening campaign which held during the study period and who gave their consent to participate to the study. Were excluded, from our study, all health personnel and those who refused to give their consent to participate to our study.

On arrival at the campaign site, the participant was given explanations on the aim, the process, the advantages and disadvantages of participating to the investigation. Their questions and worries were answered by the investigating team and a verbal consent was then required from the participant. They were then given questionnaires to fill.

Variables of interest were collected and included the socio-demographic data of respondents (age, sex, number living children, their marital status and level of education), their general knowledge on HIV (definition, route of transmission and means of prevention) and their knowledge on PMTCT (existence of preventive measures components of PMTCT, feeding of exposed infants).

Data collected were entered in a data sheet using CSPRO V. 7 and analysed using IBM SPSS. Socio-demographic characteristics were expressed as percentages for qualitative variables and means and standard deviations for quantitative variables. In order to determine the level of knowledge of respondents, we coded each question to a one or zero variable, giving each question one point if the answer was true and zero if it was false.

Concerning knowledge on HIV, the questions 5, 8, 9 and 13 were used. In order to determine the level of knowledge on HIV; we summed up the number of points to get the total which was equal to 30. We determined the mean number of points scored by respondents which was equal to 25.3. We then defined various categories of level of knowledge from our mean. Those who scored greater than or equals to 25 were classified as having a satisfactory knowledge, then those who scored less than 25 were considered as having an unsatisfactory knowledge on HIV. We then found the average number of points scored by respondents for knowledge on HIV as well as that on PMTCT. For PMTCT, the questions 10, 11, 12, 13, 14, and 15 of the questionnaire were used. The total of points was 18. The satisfactory knowledge was defined by more or equals 10, and the unsatisfactory by less than 10. Respondents were then divided into two categories; those with satisfactory knowledge if they were above the average number of points and unsatisfactory if they were below. Chi-square test was used to compare variables with a P value < 0.05 as threshold of statistical significance. Crude and adjusted odd ratios were determined using a logistic regression in order to assess the degree of association between the characteristics of respondents with their sources of information and the level of knowledge of these res-

pondents, hence identifying factors associated with their level knowledge.

### 3. Results

A total of 301 participants were interviewed on their knowledge concerning HIV and PMTCT.

The sex ratio was 1.6 women for one man. The mean age of participants was  $34.30 \pm 11.09$  years and participants aged between 25 to 35 years (104). The highest level of education was university level for most participants 170 (56.5%). Most of them were bachelors (44.9%) and had no living child in charge (48.2%).

Health personnel were the main source of information on HIV (84.7%), followed by radio and television (65.8%) in **Table 1**.

Concerning their knowledge on HIV, 91.7% responded that it was a sexually transmissible infection. Concerning the transmission of HIV most respondent knew that it could be transmitted through unprotected sexual intercourse (97.7%), contaminated objects (77.1%), unsafe blood transfusion, (71.8%) and from a mother to her child (71.8%). The majority of respondents knew that new-borns (88.7%), children (84.1%) and teenagers (87.7%) could be infected with HIV. Concerning their knowledge on prevention of HIV most respondents knew that HIV could be prevented by abstinence (96.7%), fidelity to a single partner (82.1%), the use of condom (90.0%) and by avoiding contaminated objects (75.5%).

Concerning mother to child transmission, most respondents knew that an infected mother could transmit HIV to her child (92%) and the majority also knew that an HIV positive couple could give birth to an uninfected child (90.7%). Concerning mode of transmission, only 49.2% knew that HIV could be transmitted during pregnancy, 67.4 % during delivery and 61.5% during breast feeding. Only 47.8% knew that an HIV positive mother could breast feed.

Concerning prevention of mother to child transmission, most respondents knew that HIV transmission from the mother to the child could be prevented (89.7%). And that this could be done by early screening (77.6%), giving ARV to the mother (77.3%), giving birth in a health facility (50.55%) and using low risk delivery technics (50.18%), Only 38.10% knew that ARV could be given to new-borns in order to prevent the transmission of HIV to them.

Concerning the level of knowledge of respondents on HIV, 65.4% (197) had a satisfactory knowledge while 34.6% (104) had an unsatisfactory knowledge.

Meanwhile for PMTCT, 64.1% (193) had a satisfactory knowledge while 35.9 (108) had an unsatisfactory knowledge in **Table 2**.

From our logistic regression, concerning knowledge on HIV, we observed that women were about 2 times more likely to have a satisfactory knowledge on HIV compared to men [ORa = 2.24 (1.35 - 3.72) (P value: 0.002)]; The University level of education was associated to good knowledge, people who ended studies at university level where 2.08 times more likely to have a satisfactory knowledge on HIV compared to those who ended before university level [ORa: 2.08 (1.26 - 3.44)

**Table 1.** Socio-demographic characteristics and main source of information of the study population.

Characteristics and source of information on HIV and PMTCT	Interviewed people	
	N = 301	
	n	%
<b>Sex</b>		
Male	117	38.9
Female	184	61.1
<b>Age mean <math>\pm</math> SD:</b> 34.30 $\pm$ 11.09 years		
<b>Age (min; max):</b> (15; 62) years		
<b>Age</b>		
[15 - 25[	77	25.6
[25 - 35[	104	34.6
[35 - 45[	67	22.3
[45 - 55[	37	12.3
[55 - 62]	16	5.3
<b>Level of education</b>		
Aucun	4	1.3
Primary	29	9.6
Secondary	98	32.6
University	170	56.5
<b>Marital status</b>		
Bachelor	135	44.9
Married	103	34.2
Cohabitation	51	16.9
Divorced/Widow	12	4.0
<b>Number of living children</b>		
0	145	48.2
1 - 4	122	40.5
5 - 8	34	11.3
<b>Health personnel</b>		
Yes	255	84.7
No	46	15.3
<b>Family and friends</b>		
Yes	163	54.2
No	138	45.8
<b>Internet and social media</b>		
Yes	203	67.4
No	98	32.6
<b>Radio and television</b>		
Yes	198	65.8
No	103	34.2

**Table 2.** Rating of Knowledge on HIV and PMTCT.

Level of knowledge	Interviewed population	
	N = 301	
	n	%
<b>Mean knowledge points HIV</b> 25.3 ± 3.4		
<b>Level of knowledge</b>		
Satisfactory (≥25)	197	65.4
Unsatisfactory (<25)	104	34.6
<b>Mean knowledge points PMTCT</b> 10.9 ± 2.6		
<b>Level of knowledge</b>		
Satisfactory (≥9)	193	64.1
Unsatisfactory (<9)	108	35.9

( $P = 0.004$ ); The health personnel as source of information were 3.09 times more likely to have a satisfactory knowledge compared to those who were not [ORa: 3.09 (1.59 - 5.99) ( $P = 0.001$ ).

Concerning knowledge on PMTCT, women were about 2 times more likely to have a satisfactory knowledge on compared to men [ORa: 1.97 (1.12 - 3.20) ( $P$  value = 0.006)]. Family and friends as source of information were more likely to have a satisfactory knowledge compared to those who were not [ORa: 1.67 (1.03 - 2.70) ( $P$  value = 0.037)] in **Table 3**.

#### 4. Discussion

The study aimed at assessing the level of knowledge of a group of adults participating at screening campaign at the Gyneco-obstetrics and pediatric hospital of Yaoundé. We had 301 participants. From our findings, the respondents were mostly within the age range of fecundity (15 to 49 years) and this was in line with the findings of many authors [3] [5] [7] [8]. There were more women than men and this can be explained by the fact they have the tendency to seek for medical assistance more than men. These results were similar to those reported by Alwafi *et al.* in Saudi Arabia and Calderon *et al.* in Bolivia [9] [10]. The level of education of the study population was mostly university level these results could be explained by the context wherein the city of Yaoundé is a university center possessing two states universities and many higher education private school making the population of the city highly educated and these results go in line with the findings of Zarei *et al.* in Iran and Alwafi *et al.* in Saudi Arabia where university level was predominant in their study population [8] [9]. However, the results were different from those of reported by Teshale *et al.* and Zegeye *et al.* who reported a predominance of secondary level education [5] [11]. The difference here could be explained by the fact that they conducted their studies at regional level thereby including many sub-Saharan African countries. Most respondent were single in our series and this could be explained by the

**Table 3.** Distribution of population according to the association between their socio-demographic characteristics and sources of information with their level of knowledge on HIV and PMTCT.

	Level of Knowledge				ORc (CI 95%)	P value	ORa (95% CI)	P value	
	Total	Satisfactory		Unsatisfactory					
	N = 301	N = 197	N = 104						
	n	%	n	%					
<b>Association with knowledge on HIV</b>									
<b>Age</b>									
25 - 34	102	74	72.6	28	27.4	1			
35 - 44	68	47	69.1	21	30.9	1.35 (0.70 - 2.62)	0.375	1.19 (0.59 - 2.40) 0.627	
15 - 24	66	39	59.1	27	40.9	1.83 (0.95 - 3.52)	0.071	1.86 (0.93 - 3.73) 0.077	
45 - 54	43	22	51.2	21	48.8	<b>2.52 (1.20 - 5.28)</b>	<b>0.014*</b>	1.97 (0.90 - 4.36) 0.090	
55 - 62	22	17	77.7	5	22.7	0.78 (0.26 - 2.31)	0.651	0.60 (0.19 - 1.89) 0.383	
<b>Sex</b>									
Men	117	64	54.7	53	45.3	1			
Women	184	133	72.3	51	27.7	<b>2.16 (1.32 - 3.51)</b>	<b>0.002*</b>	<b>2.24 (1.35 - 3.72) 0.002*</b>	
<b>Level of education</b>									
			41.2						
Lower than university	131	75	57.2	56	42.8	1			
University	170	122	71.8	48	28.2	<b>1.89 (1.17 - 3.07)</b>	<b>0.009*</b>	<b>2.08 (1.26 - 3.44) 0.004*</b>	
<b>Health personnel as source of information</b>									
No	46	20	43.5	26	56.5	1			
Yes	255	177	69.4	78	30.6	<b>2.95 (1.55 - 5.60)</b>	<b>0.001*</b>	<b>3.09 (1.59 - 5.99) 0.001*</b>	
<b>Radio and television as source of information</b>									
No	103	58	56.3	45	43.7	1			
Yes	198	139	70.2	59	29.8	<b>1.83 (1.11 - 3.00)</b>	<b>0.016*</b>	1.45 (0.85 - 2.50) 0.175	
<b>Internet and as source of information</b>									
No	98	59	60.2	39	39.8	1			
Yes	203	138	68.0	65	32.2	1.40 (0.85 - 2.31)	0.184	0.93 (0.50 - 1.74) 0.818	
<b>Association with Knowledge on PMTCT</b>									
<b>Sex</b>									
Men	117	64	54.7	53	45.3	1			
Women	184	129	70.1	55	29.9	<b>1.94 (1.20 - 3.14)</b>	<b>0.007*</b>	<b>1.97 (1.12 - 3.20) 0.006*</b>	
<b>Number of Children</b>									
No Child	145	86	59.3	59	40.7	1			
1 - 4	122	82	67.2	40	32.8	0.71 (0.43 - 1.18)	0.183	0.81 (0.48 - 1.37) 0.434	
5 - 8	34	25	73.5	9	26.5	0.52 (0.23 - 1.20)	0.128	0.59 (0.25 - 1.37) 0.216	
<b>Family and Friends as source of information</b>									
No	138	80	58.0	58	42.0	1			
Yes	163	113	69.3	50	30.7	<b>1.63 (1.02 - 2.63)</b>	<b>0.041*</b>	<b>1.67 (1.03 - 2.70) 0.037*</b>	

P < 0.05 was considered significant. c = crude, a = adjusted, \*significant.

increased tendency to bachelorhood nowadays and these results concurred those of Haffejee *et al.* where most respondents in their series were single [12].

The main source of communication of most respondents being health personnel though an important proportion of respondents had as source of information internet and social media. This could be explained by the urban context of our study where there are many hospitals and health centers where people could get information on health issues and there is access to internet as it was reported by Luba *et al.* in their series, wherein people living in urban area had access to internet and other means of communication and could therefore be educated on HIV and PMTCT better than those living in rural areas [13]. These results were different from those obtained by Darteh *et al.* in South Africa where by radio was the main source of info as well as those of Di Guiseppe *et al.* in Italy where only 18.2% claimed physicians as their principal source of information [14] [15].

Regarding their knowledge on the definition of HIV and its mode of transmission and prevention the response was generally good with respondents scoring above points on 30. Proportion of correct response ranged 55.8% to 96.7%. Most people knew that HIV was could be transmitted through sexual intercourse, contact with blood and pricks with contaminated objects, transfusion with infected blood and that it could be prevented by abstinence, fidelity to one partner and the use of condom. These results concords with those reported by Haffejee *et al.* in south Africa, Guiseppe *et al.* in Italy, Wang *et al.* in Japan and Okonkwo *et al.* in Nigeria. This can be explained by the massive communication strategies on HIV via various means of communication during the past years [12] [15] [16] [17]. The majority of respondents had an acceptable knowledge on HIV and this is thanks to the continuous sensitization on the illness by all means.

Regarding mother to child transmission (MTCT) and prevention of mother to child transmission of HIV (PMTCT) response to questions ranged from 38.1 to 92.0 and the level of knowledge on PMTCT was lower than that on HIV. Only 49.2% of respondents knew that HIV could be transmitted during pregnancy and only 38.1% of respondents knew that ARV was given to newborns in order to prevent mother to child transmission. Our results were very similar to those obtained by Liyeh *et al.* in Ethiopia and this could be explained by the fact that there is less communication on MTCT and PMTCT which targets mostly pregnant women during ante natal clinic sensitizations. Globally knowledge on MCT and PMTCT was fairly good with a proportion of 64.1% scoring above average. And this concurred with other studies conducted on PMTCT by Liyeh *et al.*, Teshale *et al.* and were higher than those obtained by Darteh *et al.* [3] [5] [14]. They were lower than those obtained by Egbe *et al.* in South west Cameroon. This difference could be explained by the context whereby the study done by Egbe *et al.* was conducted on women attending routine ante natal clinics whereas ours was conducted on a screening campaign [18].

Regarding factors associated with satisfactory knowledge the multivariate



analysis revealed that the good answer of respondent was associated with both knowledge on HIV and PMTCT. Women were more likely to have a better knowledge than men this could be explained by the fact that many women tend to attend educative sessions done during ante natal clinic, vaccination and also women empowerment communications. They are sensitized to HIV and PMTC whereas men most of the times do not attend to these educative talks. Other authors such as Wang *et al.*, Okonkwo *et al.* and Pachau *et al.* studied the association between gender and knowledge and their results showed no association [16] [17] [19].

Other factors for knowledge on HIV included level of education wherein those with university education had a better knowledge on HIV than those without and these results were in line with the findings of Di Guiseppe in Italy and Alemu *et al.* in Ethiopia wherein university level of education was associated with good knowledge on HIV [15] [20]. From our findings, those whose sources of information were health personnel had a satisfactory knowledge compared to those whom health personnel were not the main source of information. And this could be explained by the fact that from their professional background and training, health personnel are better placed to educate and communicate on HIV than any other source. Our results concurred with those of Di Guiseppe *et al.* in Italy where those who had physicians as source of information were more likely to have a good knowledge on HIV [15].

## 5. Conclusion

Knowledge regarding HIV and PMTCT among the adult population is capital in the fight against HIV/AIDS. Due to sensitization campaigns, and massive communication done on HIV in previous years, the knowledge of the majority of clients on HIV is good. Concerning PMCT, the knowledge on the mode of transmission, ARV prevention to the babies or feeding recommendations on expose HIV infants is still poor. However, we still notice some drawbacks such as a decreased exposure of men to HIV and PMTCT sensitization. It is therefore important for them to actively participate with their partners to ante natal clinic sessions in order to be educated on HIV and PMTCT. Furthermore, emphasis should be done on continuous education via all existing means of communication so as to touch a maximum number of adults.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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