

ORIGINAL RESEARCH ARTICLE

Is Male Involvement in ANC and PMTCT Associated with Increased Facility-Based Obstetric Delivery in Pregnant Women?

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Abstract

Ensuring that pregnant women are delivering in a health facility and are attended to by skilled birth attendants is critical to reducing maternal and infant morbidity and mortality. This study sought to determine the associations between male involvement in antenatal care (ANC) services and pregnant women delivering at health facilities and being attended to by skilled birth attendants as well as attending postnatal care. This was a retrospective cohort study using secondary analysis of program data. We reviewed health records of all pregnant women who attended antenatal services irrespective of HIV status between March and December 2012 in 10 health facilities in three provinces of Zambia. An extraction questionnaire was used to collect socio-demographic and clinical information from registers used in services for maternal neonatal child health as well as delivery. Using logistic regression, we calculated the odds ratios (OR) and 95% confidence intervals (CI) of the association between (1) male involvement and delivery at a health facility by a skilled birth attendant and (2) male involvement and women's attendance at postnatal services. We found that more women who had been accompanied by their male partner during ANC delivered at a health facility than those who had not been accompanied (88/220=40% vs. 543/1787=30.4%, respectively; OR 1.53, 95% CI: 1.15-2.04). Also, we noted that a greater proportion of the women who returned for postnatal visits had been accompanied by their partner at ANC visits, compared to those women who came to ANC without their partner (106/220=48.2% vs. 661/1787=37.0%, respectively; OR 1.58, 95% CI: 1.20-2.10). Male involvement seems to be a key factor in women's health-seeking behaviours and could have a positive impact on maternal and infant morbidity and mortality. (*Afr J Reprod Health* 2015; 19[2]: 117-124).

Keywords: antenatal care, HIV, males, facility delivery, postnatal care, Zambia.

Résumé

S'assurer que les femmes enceintes accouchent dans un établissement de santé et qu'elles sont prises en charge par des accoucheuses qualifiées est essentiel pour réduire la morbidité et la mortalité maternelle et infantile. Cette étude visait à déterminer les associations entre la participation des hommes aux services de soins prénatals (SPrN) et des femmes enceintes qui accouchent dans des établissements de santé et d'être assistées par des accoucheuses qualifiées ainsi que la participation dans des soins postnatals (SPN). Il s'agissait d'une étude de cohorte rétrospective effectué à l'aide d'une analyse secondaire des données du programme. Nous avons examiné les dossiers de santé de toutes les femmes enceintes qui ont assisté à des services de soins prénatals indépendamment de leur statut du VIH entre mars et décembre 2012 dans 10 établissements de santé dans trois provinces de la Zambie. Un questionnaire d'extraction a été utilisé pour recueillir des informations socio-démographiques et cliniques à partir des registres utilisés dans les services de santé maternelle de l'enfant nouveau-né ainsi que l'accouchement. À l'aide de la régression logistique, nous avons calculé les odds ratios (OR) et 95% d'intervalles de confiance (IC) de l'association entre (1) la participation des hommes et de l'accouchement dans un établissement de santé par une accoucheuse qualifiée et (2) la participation des hommes et la présence des femmes aux services postnatals. Nous avons constaté que plus de femmes qui avaient été accompagnées de leurs partenaires masculins pendant SPrN ont accouché dans un établissement de santé que celles qui n'avaient pas été accompagnées (88/220 = 40% contre 543/1787 = 30,4%, respectivement; OR 1,53, 95% CI: 01/15 à 02/04). En outre, nous avons constaté qu'une plus grande proportion des femmes qui sont revenues pour des visites postnatales avaient été accompagnées par leurs partenaires lors des visites prénatales, par rapport à ces femmes-là qui venaient pour les SPrN sans leurs partenaires (106/220 = 48,2% contre 661/1787 = 37,0%, respectivement; OR 1,58, IC à 95%: 1.20 à 2.10). La participation des hommes semble être un facteur clé dans la recherche de comportement de santé des femmes et pourrait avoir un impact positif sur la morbidité et la mortalité maternelle et infantile. (*Afr J Reprod Health* 2015; 19[2]: 117-124)

Mots-clés: soins prénatals, le VIH, les hommes, la prestation de service, les soins postnatals, Zambie.

Introduction

Zambia has made great strides in implementing integrated reproductive health services through antenatal care (ANC) clinics by increasing the number of health facilities that offer these services. Although ANC attendance by pregnant women was high in 2007 (96%)¹, less than 50% of deliveries in Zambia occur in health facilities and are attended to by qualified staff in health institutions^{1,2}. The high rate of dropout between ANC attendance and health facility delivery has significant effects on both maternal and infant outcomes.

As part of integrated reproductive health services in ANC, prevention of mother-to-child transmission (PMTCT) services have been scaled up from 19% of all health centres in 2005^{2,3} to 81% by 2012^{1,4}, resulting in an increase in HIV testing among pregnant women from 14% in 2005 to 94% in 2010¹. The high HIV prevalence rates in Zambia (14.3% — higher in women compared to men)⁵ has a direct impact on mother-to-child transmission of HIV (MTCT). Therefore, the provision of HIV counselling and testing (HCT) to all pregnant women and their partners during ANC is an important entry point to interventions for preventing MTCT.

Good obstetric practices during labour and delivery by skilled birth attendants as well as immediate postnatal care are part of the continuum of services for both mothers and exposed infants born to HIV-positive women^{6,7,8}. Therefore, interventions that will support pregnant women in attending ANC services and delivering in health facilities need to be encouraged. One such proposed intervention is for pregnant women to attend ANC services with their partner. Some studies have shown that male involvement through participation in couples counselling and testing during ANC is effective in lowering attrition along the ANC and PMTCT programs cascade^{9,10}. This strategy confers additional benefits of improved adherence to antiretroviral therapy (ART) and increased HIV-free infant survival^{9,12}. But despite the emerging global interest in male involvement, there is limited published evidence in Zambia on what effect male involvement has on health

facility delivery assisted by skilled birth attendants or on the uptake of postnatal care services.

Evaluations of PMTCT programs, which are often implemented within the confines of safe motherhood programs, have similarly shown male involvement to positively influence uptake of HIV testing and preventive interventions for vertical and sexual transmission of HIV^{13,14}. In a study from Malawi, pregnant women in ANC were encouraged to attend with their spouses and to participate in what is called “couple counselling” before and after undergoing HIV testing. Men were encouraged to come to the health facility with children under five years of age for screening, immunization, and growth monitoring. As a result of these interventions, it was noted that over 10% of women who came to the health facility were accompanied by their husbands⁶. The study concluded that when men were encouraged to be involved in ANC and postnatal services, more women were more likely to adhere to PMTCT interventions and MTCT was reduced^{6,10,15}. Similarly, the potential of including men in prenatal education has recently been recognized, suggesting that moving beyond traditional prenatal health promotion that involves only women may reduce overall infant mortality, particularly in populations with considerable health disparities¹⁶.

Our study aimed to determine the association between male involvement in ANC and health-facility-level delivery by skilled attendants and women’s attendance of postnatal visits at health facilities. We also determined the association between male involvement in PMTCT activities among HIV-positive pregnant women and health-facility-level delivery by skilled attendants and attendance of postnatal visits at health facilities. Adherence to the interventions administered at each of these stages of care in ANC for the HIV-positive woman and her exposed infant will reduce MTCT^{6,10}.

Methods

Design and instruments

In this retrospective cohort study we used health information management aggregation registers from the ANC department in public health

facilities in Zambia. We used these national registers to extract data that were standard across all 10 study sites. A data extraction form was designed to collect study participants' variables from safe motherhood, integrated counselling and testing, labour ward, and delivery registers. Using the extraction form, we collected information on socio-demographic variables such as age, marital status, medical history, ANC attendance, obstetric history, HCT, reasons for referral, mode of delivery, and postnatal care at six days and six weeks and whether women were accompanied by their partner. The integrated counselling and testing register contains data about HCT on pregnant women accompanied or not accompanied by a male partner and male partner testing and results. In each of these registers, the pregnant woman who is registered for ANC is identified with a unique safe motherhood number. The safe motherhood and integrated counselling and testing registers are located in the ANC department of the selected health facilities. The facility labour and delivery registers are found in the labour ward.

Data for this study were extracted by data entry clerks (DECs) who are employed to enter clinic data into a national database. The DECs is cadre employed by the Ministry of health to manage data in health facilities and prepare reports for submission to district health office. To ensure that they understood the study objectives, a two-day study-specific training was undertaken. The data extracted were entered into a Microsoft Access database at each site.

The extraction form was validated by pretesting before and after the study-specific training. Additional validation was done through quality assurance visits undertaken by the study team. There were built-in data entry rules in the database to ensure that information on the extraction form was standardized and met the study criteria. The numbers assigned to the safe motherhood participants and recorded in the data sheets could be linked to the identity of the mother by referring to the source document (register). The safe motherhood number was used for purposes of data management, validation, and verification. Onsite data validation processes were undertaken by the site supervisor who compared the extracted data with the information in the registers.

Sampling of health facilities

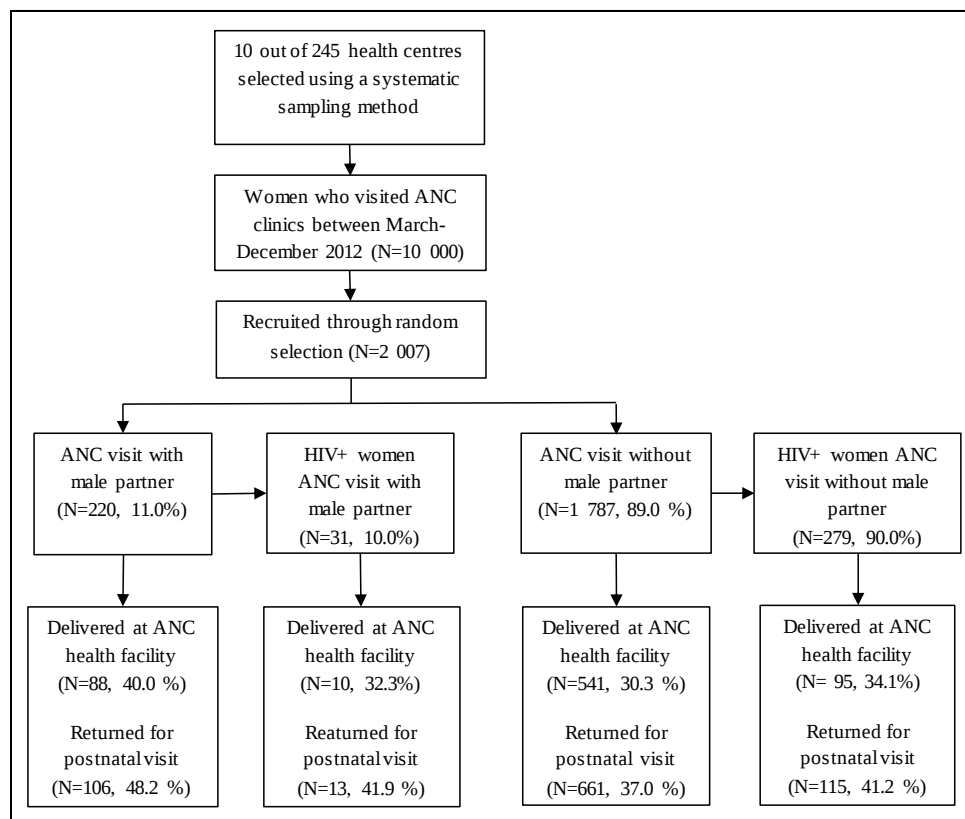
We used systematic random sampling to select 10 study sites from a list of 245 public health facilities supported by the Zambia Prevention, Care and Treatment (ZPCT II) project. The project supports the government of Zambia in scaling up HCT and ANC services in six provinces. Health facilities that did not have program service statistics on male involvement in ANC or on the number of facility deliveries were excluded from the sample, as were all general and district level hospitals, which are generally referral centres.

Participants

All pregnant women who accessed ANC services at the study sites from March 2012 to December 2012 and had been registered in the Safe Motherhood, Integrated Counselling and Testing, and Labour Delivery registers were eligible for inclusion in the sample. As part of routine PMTCT program in Zambia, pregnant women are encouraged to come with their male partners to the health facility for couple counselling and testing for HIV in the ANC. We therefore defined male partner involvement as couples attending an ANC education session and HTC. We measured male involvement by reviewing documentation in Integrated Counselling and Testing Register that records male partner attendance in ANC as part of the national prevention of MTCT program.

Statistical methods

We used the median and interquartile range (IQR) to describe the age distribution of the participants, numbers and percentages (%) to describe the distribution of categorical variables. We used logistic regression to obtain the odds ratio (OR) and 95% confidence intervals of the associations between (i) male involvement in ANC and delivery at health facility and (ii) male involvement in ANC and post-natal visit at the health facility. We used Wald test in the logistic regression models to reject the null hypotheses of no association between male involvement in ANC and (i) delivery at health facility; (ii) post-natal visit at the health facility at p-value <0.05. We also performed the same logistic regression analyses on a sub-group of women that were HIV-positive.

Figure 1: Flow Chart of Participants

Results

We obtained information for 2007 pregnant women from the ANC registers in 10 health facilities for the period between March and December 2012. Of the 2007 women, 734 (36.6%) delivered at a health facility (**Figure 1**). The median age of these 2007 women was 24 years (IQR: 20-29). Over 95% of the women were married (**Table 1**).

Of the 2007 women, 220 (11.0%) were accompanied by a male partner during ANC visits, whereas 1787 (89.0%) were not accompanied by their partner. Of the 220 pregnant women who attended ANC services with their male partner, 88 (40.0%) delivered at a health facility; in contrast, out of 1787 pregnant women who were not accompanied by a male partner, only 543 (30.3%) delivered at a health facility (OR 1.53, 95% CI: 1.15 -2.03) (**Table 2**). Of the 220 males who accompanied their female partners for ANC services, 206 (93.6%) tested for HIV.

Table 1: Baseline Demographic Characteristics for 2007 Women in the ANC Clinics

Characteristic	Number (%)
Age categories (years)	
10-16	20 (1.0)
16-20	487 (24.3)
21-25	599 (29.8)
26-30	546 (27.2)
31-35	241 (12.0)
36-40	93 (4.6)
>40	21 (1.0)
Marital status	
Married	1925 (95.9)
Unmarried	79 (3.9)
Unknown	3 (0.1)
Parity	
0-2	1495 (74.5)
3-5	472 (23.5)
6-8	36 (1.8)
9-11	4 (0.2)

Table 2: Association Between Male Involvement in ANC and Delivery at Health Facility

Delivery at health facility							
All women		Yes	No	Total (n=2007)	Odds	OR (95% CI)	p-value
Male involvement	Yes	88/220 (40.0%)	132/220 (60.0%)	220	88/132	1.53 (1.15 - 2.04)	0.004
	No	543/1787 (30.4%)	1244/1787 (69.6%)	1787	543/1244		
HIV-positive women		Yes	No	Total (n=310)	Odds	OR (95% CI)	p-value
Male involvement	Yes	10/31 (32.3%)	21/31 (67.7%)	31	10/21	0.88 (0.40 - 1.94)	0.751
	No	98/279 (35.1%)	181/279 (64.9%)	279	98/181		

Table 3: Association Between Male Involvement in ANC and Postnatal Visit

		Postnatal visit at health facility					
All women		Yes	No	Total (n=2007)	Odds	OR (95% CI)	p-value
Male involvement	Yes	106/220 (48.2%)	114/220 (51.8%)	220	106/114	1.58 (1.20 -2.10)	0.001
	No	661/1787 (37.0%)	1126/1787 (63.0%)	1787	661/1126		
HIV-positive women		Yes	No	Total (n=310)	Odds	OR (95% CI)	p-value
Male involvement	Yes	13/31 (41.9%)	18/31 (58.1%)	31	13/18	1.03 (0.49 - 2.19)	0.939
	No	115/279 (41.2%)	164/279 (58.8%)	279	115/164		

Of the 220 women who attended ANC services with their male partners, 106 (48.2%) returned for a postnatal visit, whereas out of the 1787 women who were not accompanied by their male partner, 661 (37.0%) returned for a postnatal visit; (OR 1.58, 95% CI: 1.20-2.10) (**Table 3**). Of the 2007 women, 310 (15.4 %) were HIV-positive. Of these 310 HIV-infected women, 31 (10.0%) were accompanied by a male partner during ANC visits, whereas 279 (90.0%) were not. There was no significant difference between the HIV-positive women who were accompanied by a male partner and those who were not, with regards to whether the women delivered at a facility or returned for postnatal visits (**Tables 2 and 3**)

Discussion

We examined the association between male

involvement in ANC services and delivery at health facilities and postnatal visits at health facilities. The likelihood of delivering at a health facility was significantly higher among pregnant women who were accompanied by a male partner. In our study, 40% of pregnant women who were accompanied by a male partner delivered at a health facility. The findings in our study are consistent with findings in a study on birth preparedness in rural Uganda, which reported that 68.6% of pregnant women who were accompanied by their spouses during ANC had partner support to deliver at the health facility. Other studies on male partner participation in ANC in Tanzania and Kenya have made strong recommendations for maximising the health benefits it confers on infant survival. Male involvement was associated health facility-based deliveries, thereby reducing

maternal and infant mortality^{7-10,11}.

There was a significant association between male involvement and women returning for postnatal visits at the health facility. More than a third of the women who were accompanied by their partners during ANC returned to the clinic after birth for postnatal care. Poor postnatal attendance may also be due to cultural practices and beliefs in the African setting, which traditionally keep mothers and babies indoors during the first month after birth^{17,18}. Male involvement could be a feasible and effective strategy for encouraging women to go for postnatal visits. The male partner participation in ANC in our study was low compared to the 12.5%, 16%, 65.4%, and 25% reported from other studies on male partner participation in PMTCT programs in northern Tanzania, Kenya, Uganda, and Ivory Coast respectively, whereas it was higher than that reported in Malawi (3.2%)^{7-9,19}.

We found that 11.0% of women were accompanied by their male partner. This was a low percentage given the fact that 95.9% of the women who attended ANC services during the study period were married. There were no data available on the proportion of women who were accompanied by male partners at postnatal visits because the data source did not have provision to capture this variable. This information would have been important to know; men's roles during the postpartum period are traditionally more limited than in the antenatal period because female family members more commonly assist the woman at this time¹⁶⁻²⁰. It is possible, therefore, that taking his wife to a postpartum check-up may provide a concrete way for a husband to feel less "left out" and to become involved during the postpartum period. As well, husbands may perceive the postpartum check-up as being important for the baby, and may therefore express greater interest^{16,20-22}.

Among the 310 HIV-positive women in this study, 10.0% were accompanied by their male partner. This proportion was similar to that seen in all the women included in this study. However, there was no significant association between delivery at a health facility and male involvement in ANC services among HIV-positive women. Likewise, there was no significant association

between postnatal visits and male involvement in ANC services among HIV-positive women. There could be several reasons for this difference. The sample size of HIV-positive women was small. As such, this study may not have been powered sufficiently to detect an association between male involvement in ANC and (1) delivery at a health facility or (2) postnatal visit among the HIV-positive women. Also, previously reported barriers to male involvement in ANC among HIV-positive women may have played an important role in not detecting associations with the outcomes. It has previously been reported that HIV-positive women experienced fear of domestic violence, stigmatization, or divorce when they asked their male partners to accompany them at ANC and postnatal services.¹³⁻¹⁸⁻²² Such factors may hinder these women from delivering at a health facility or returning for postnatal visits.

The limitation of this study was that we used already collected data to perform secondary analyses. As such, the study did not control for possible confounders. Because of using four health information management aggregation registers namely the Safe motherhood, Integrated counselling and testing, labour ward and Post-natal care registers, it was time consuming to trace the mother from the time she was seen in ANC to the time she was seen at post-natal care six weeks after delivery. However we were able to retrieve the information that we needed to meet the study objectives.

Conclusion

This study established that male involvement in ANC among pregnant women in general, irrespective of their HIV status, was associated with more health facility deliveries assisted by skilled birth attendants and more attendance for postnatal care for their infants. Male involvement seems to be a key factor in women's health-seeking behaviours and could have a positive impact on maternal and infant morbidity and mortality.

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Ethical Approval

Approval was obtained from the FHI 360 Protection of Human Subjects Committee (Ref No: 458573-3), Durham, NC, USA; from the ERES Converge Ethics Committee (Ref No: 2013-May-006); and from the Ministry of Health, Lusaka, Zambia.

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Declaration of Interest

The authors report no declarations of interest.

Contribution of Authors

Conceived and designed the study: JK, NN, SM, JM, NC, PK, AM, MW. Collected data: JK, NN, SM. Analysed the data: NC, JK, NN, SM, AML. Prepared the first draft of manuscript: JK, NN, AML. Reviewed manuscript: JK, NN, SM, JM, NC, PK, AML, AM, MW. Approved manuscript for submission: JK, NN, SM, JM, NC, PK, AML, AM, MW.

References

1. UNICEF. Countdown To Zero Elimination of New HIV Infections Among Children by 2015 And Keeping Their Mothers Alive. In: UNICEF, editor, 2012.
2. Ministry of Health (MOH) [Zambia]. ANNUAL REPORT: Ministry of Health- Zambia, 2006:21.
3. Ministry of Health (MOH) [Zambia] CSOZ, and Macro International Inc. 2006. Calverton, Maryland, USA: Ministry of Health, Central Statistical Office, and Macro International Inc. Zambia HIV-AIDS Service Provision Assessment Survey 2005. In: Health Mo,

- editor: Calverton, Maryland, USA: Ministry of Health, Central Statistical Office, and Macro International Inc., 2005:17.
4. Ministry of Health (MoH) [Zambia]. The 2012 List of Health Facilities in Zambia- Preliminary Report In: Unit DoPpME, editor, 2012.
5. Central Statistical Office (CSO) MoHM, Tropical Diseases Research Centre (TDRC),, University of Zambia aMIIZDaHS, Calverton M, USA: CSO and Macro International Inc. *Demographic and Health Survey_DHS 2007*:: Calverton, Maryland, USA: CSO and Macro International Inc., 2007.
6. Kasenga F. Making it happen: prevention of mother to child transmission of HIV in rural Malawi. *Glob Health Action* 2010;3.
7. Kakaire O, Kaye DK, Osinde MO. Male involvement in birth preparedness and complication readiness for emergency obstetric referrals in rural Uganda. *Reprod Health* 2011;8:12.
8. PEPFAR. Prevention of Mother-to-Child Transmission of HIV: Expert Panel Report and Recommendations to the U.S. Congress and U.S. Global AIDS Coordinator 2010.
9. Farquhar CK, J. N. Richardson, B. A. Kabura, M. N. John, F. N. Nduati, R. W. Mbori-Ngacha, D. A. John-Stewart, G. C. Antenatal couple counseling increases uptake of interventions to prevent HIV-1 transmission. *J Acquir Immune Defic Syndr* 2004;37(5):1620-6.
10. Aluisio A, Richardson BA, Bosire R, John-Stewart G, Mbori-Ngacha D, Farquhar C. Male antenatal attendance and HIV testing are associated with decreased infant HIV infection and increased HIV-free survival. *J Acquir Immune Defic Syndr* 2011;56(1):76-82.
11. Katz DA, Kiarie JN, John-Stewart GC, Richardson BA, John FN, Farquhar C. Male perspectives on incorporating men into antenatal HIV counseling and testing. *PLoS One* 2009;4(11):e7602.
12. Nyondo ALM, A. S. Chimwaza, A. F. Assessment of strategies for male involvement in the prevention of mother-to-child transmission of HIV services in Blantyre, Malawi. *Glob Health Action* 2013;6:22780.
13. Aarnio P, Olsson P, Chimbiri A, Kulmala T. Male involvement in antenatal HIV counseling and testing: exploring men's perceptions in rural Malawi. *AIDS Care* 2009;21(12):1537-46.
14. Auvinen. et. Male Involvement and Prevention of Mother-to-Child Transmission of HIV in Sub-Saharan Africa: An Integrative Review. *Curr HIV Res* 2013;11 (169-177).
15. Brusamento S, Ghanotakis E, Tudor Car L, van-Velthoven MH, Majeed A, Car J. Male involvement for increasing the effectiveness of prevention of mother-to-child HIV

- transmission (PMTCT) programmes. *Cochrane Database Syst Rev* 2012;10:CD009468.
16. Bond MJ. The missing link in MCH: paternal involvement in pregnancy outcomes. *Am J Mens Health* 2010;4(4):285-6.
17. Dunlap J, Foderingham N, Bussell S, Wester CW, Audet CM, Aliyu MH. Male Involvement for the Prevention of Mother-to-Child HIV Transmission: A Brief Review of Initiatives in East, West, and Central Africa. *Curr HIV/AIDS Rep* 2014;11(2):109-18.
18. Morfaw F, Mbuagbaw L, Thabane L, Rodrigues C, Wunderlich AP, Nana P, et al. Male involvement in prevention programs of mother to child transmission of HIV: a systematic review to identify barriers and facilitators. *Curr HIV Res* 2013;2:5.
19. Kalembo FW ZM, Mulaga AN, Yukai D, Ahmed NI. Association between male partner involvement and the uptake of prevention of mother to child transmission of HIV PMTCT interventions in Mwanza district Malawi A retrospective cohort study. *PLoS One* 2013;8((6)):e66517.
20. Susin LR, Giugliani ER. Inclusion of fathers in an intervention to promote breastfeeding: impact on breastfeeding rates. *J Hum Lact* 2008;24(4):386-92; quiz 451-3.
21. Guadagno M, Mackert M, Rochlen A. Improving prenatal health: setting the agenda for increased male involvement. *Am J Mens Health* 2013;7(6):523-6.
22. Morfaw FL, Thabane L, Mbuagbaw LC, Nana PN. Male participation in prevention programmes of mother to child transmission of HIV: a protocol for a systematic review to identify barriers, facilitators and reported interventions. *Syst Rev* 2012;1:13.