

Effects of an HIV Positive Diagnosis During Pregnancy on Mother Baby Bonding at Selected Health Facilities in Lusaka District Zambia

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ABSTRACT

Background: Mother-baby bonding sets the stage for the growing child to enter healthy relationships with other people throughout life and to appropriately experience and express a full range of emotions. The stress of a diagnosis of HIV during pregnancy can lead to unsuccessful mother-baby bonding. **Aim:** The study aimed to describe the effects of an antenatal HIV positive diagnosis on mother-baby bonding. **Methodology:** A qualitative descriptive cross-sectional study design was used. Purposive sampling was used to select 17 women who were diagnosed HIV positive during pregnancy, on whom in-depth interviews were conducted post-delivery. Data were analysed using thematic analysis. **Major findings:** The majority of participants reported positive mother-baby bonding. After thematic analysis, one main theme; mother-baby interactions with three subthemes; mother-baby relationship, hurdles to mother-baby bonding and cause of baby's death, emerged. Most of the participants reported feelings of attachment to their babies, with babies responding positively to their mothers' care. Most of them breastfed, which enhanced the mother-baby bond. However, some of them reported negative bonding and constant fear of infecting their babies. Some participants reported that the stress of an antenatal HIV diagnosis led to pregnancy complications, which led to loss of their babies. **Conclusion:** Some participants reported negative bonding and some lost their babies due to pregnancy complications that were caused by stress of an antenatal HIV diagnosis. The study recommends assessing women for stress and categorising their coping strategies to assist those with high stress levels or those utilising negative coping in order to enhance mother-baby bonding.

Keywords: HIV diagnosis in pregnancy, breastfeeding, mother-baby bonding

INTRODUCTION

The earliest experiences of a human baby have a lifelong impact on their mental and emotional health [1, 2]. Under normal circumstances, once the baby is born, a bond quickly occurs between mother and baby just hours after delivery. However, this bonding process is disturbed when a mother is stressed, or incapacitated after delivery and does not feel like interacting with her new-born.

The Human Immuno-Deficiency Virus (HIV) is a blood-borne virus that is spread, largely, through unprotected sexual intercourse, and to a child from an infected mother. A diagnosis of HIV usually causes stress in the affected individual because of its lack of cure and stigmatisation attached to it [3, 4]. Individuals usually undergo Voluntary Counselling and testing in order to know their HIV status, and may postpone the VCT to a time when they are more prepared for the test and results. However, in an effort to eliminate mother-to-child transmission (eMTCTt) of HIV, pregnant women have to undergo HIV testing during antenatal care. Pregnancy is a stressful state as the body of the pregnant woman continues to adjust in order to maintain the pregnancy and prepare for labour and delivery; and the puerperium. Therefore, many women find coping with the physiological adaptation to pregnancy, antenatal screening and advice emotionally draining, and this can culminate in pregnancy and the postpartum being a fragile time of physical, social and psychological upheavals associated with depression and anxiety [5, 6]. As pregnant women undergo HIV testing, a diagnosis of HIV infection may be made during a routine antenatal care visit, when the woman may not have prepared adequately for the test and results, and this can lead to stress [7].

The stress of a diagnosis of HIV during pregnancy can affect the development of the bond between the mother and her baby, both during pregnancy and after delivery. Mother-baby bonding, which sets the stage for the growing child to enter healthy relationships with other people throughout life and to appropriately experience and express a full range of emotions, can become unsuccessful due to the stress that the mother may be experiencing as a result of the antenatal HIV diagnosis [8, 9]. The mother's emotional state during pregnancy can affect the development of her baby's brain and can cause emotional and behavioural problems; and congenital malformations [10]. Securing early bonding is essential for the baby to grow up into a secure, emotionally capable adult, while lack of it makes babies grow into depressive, anxious children, who will not cope well with life's ups and downs. Unsuccessful bonding leads to poor mental health in the mother and can have adverse and long-lasting effects on the child such as long-term mental health problems as well as reduced overall potential and happiness in the child [11, 12]. In the most difficult cases, these babies are more likely to later experience criminality, substance abuse or depressive problems. Psychological distress and anxiety in the pregnant woman have also been associated with behavioural problems in the offspring and hyperactivity in boys [2]. The effects of an HIV positive diagnosis during pregnancy can be made bearable when the affected woman is assisted to cope with her condition. All antenatal clinics are equipped to offer post-test counselling to women who have tested positive for HIV during pregnancy. The health facilities in Lusaka District also offer post-HIV test counselling. Depending on the coping strategies that a woman employs, the feelings of distress and anxiety may either increase or begin to dissipate. When a mother diagnosed with HIV infection during pregnancy utilizes effective coping strategies, the stress levels and internalised stigma decrease [7], helping the woman to lead a normal life and bond with her baby.

Governments around the world have been working tirelessly to find solutions to the problem of HIV. Moreover, the Global Fund and UNAIDS all, have global HIV strategies which are aligned with the Sustainable Development Goal target 3.3 of ending the HIV pandemic by the year 2030. The Ministry of Health, Zambia has also provided guidelines for the elimination of Mother-to-Child transmission of HIV [13]. It is crucial, therefore that pregnant women are diagnosed during antenatal care, receive treatment and support to cope to prevent vertical transmission of the virus to their unborn or breastfeeding baby, and hence contribute to the achievement of the SDGs. Studies conducted on HIV have led to many discoveries and successes in handling HIV infected individuals which has resulted in new approaches being introduced to manage HIV infected individuals, including pregnant women. However, even if there have been important medical advances in the management of HIV as well as the prevention of its spread, there are still emotional and social problems that can be as hard to deal with as the illness itself, and the stress of an HIV positive diagnosis during pregnancy could affect the bond between the mother and her baby. Many studies have also been conducted on prevention and elimination of Mother-to-Child transmission of HIV, but fewer studies have been conducted on effects of an antenatal diagnosis of HIV on mother-baby bonding [14, 15].

This study therefore aims to determine the effects of an HIV diagnosis during pregnancy on mother-baby bonding at selected Health facilities of Lusaka District, in order to provide guidelines which can enhance mother-baby bonding.

Research Question

This study was guided by the following research question:

1. How does an HIV positive diagnosis made during pregnancy affect the women and mother-baby bonding at selected Health facilities of Lusaka district?

Research Objective

The objective of this study was to describe the effects of an antenatal diagnosis of HIV infection on mother-baby bonding at selected Health facilities of Lusaka district.

MATERIALS AND METHODS

Design and Setting

This study utilized a qualitative descriptive, cross-sectional design [16]. The study was part of the longitudinal panel studies that were conducted in 3 stages to collect quantitative and qualitative data, and this was stage 3 of the study which collected qualitative data. In-depth interviews were used to explore mother-baby bonding on 16 participants who had been diagnosed HIV positive during pregnancy. The study was conducted at selected urban Health facilities of Lusaka district, which included Chilenje level 1 hospital, Kanyama level 1 hospital and George Health centre.

Chilenje and Kanyama Hospitals are some of the newly established hospitals in Lusaka which have been upgraded from Health centre to District and General hospital status respectively. The District Health office caters for all the health centres and District Hospitals within the district, while General, Teaching and Tertiary hospitals are under the management of the Provincial Health office. Found between latitude -15.416667 and longitude 28.28333299999997 at an altitude of 1, 300m in the capital of the country, Lusaka city is mostly urban, and is the most densely populated and tribally diverse city in Zambia. It has various industries, Ministries and

other Government facilities. Most of the people in Lusaka District are in formal employment and some are engaged in businesses which range from small scale to large scale. The rainy season begins in late October and ends around April each year.

Chilenje Township is a medium density area lying 7km South East of the main post office in the capital city of Zambia, and 4km away from the University Teaching Hospital, which is a tertiary hospital. The total population is 127, 594, and out of these, 34, 054 are women in the childbearing age, with 4, 673 expected pregnancies and 4, 602 expected live births per annum. (Chilenje Action Plan and Budget, 2022). The socio-economic activities in the area include various income generating activities. Most people are small scale businessmen and women and others are in formal employment such as nurses, police officers, teachers, drivers, carpenters and brick layers. There are small scale businesses in the community which includes; brick moulding, selling groceries, and selling second hand clothes (*salaula*), selling in markets and welding various objects. Originally built in 1950 as a clinic, Chilenje level 1 Hospital is one of the five big referral hospitals in Lusaka district, located in sub district 6 and it is easily accessible as it has good road and communication network. It is a full-fledged hospital, operating 24 hours each day, offering clinical and public health services in its In-patient and Outpatient Departments. It has a Maternal and Child Health Department which operates on a daily basis and offers Antenatal, Labour and delivery, Postnatal, Family planning and Child Health services. Other services offered include nutrition, physiotherapy, mental health, ART and VCT, Environmental health, various laboratory services and operating theatre services. Specialist clinics include; General Surgery, Paediatrics, Obstetrics, and Gynaecology, Ophthalmic services, male circumcision, and cervical cancer screening. Apart from these services, the hospital is a training ground for various Health Care students like nurses, clinical officers, pharmacists, anaesthetists, physiotherapists and psychosocial counsellors to mention but a few. The Hospital also caters for a rural population under its catchment.

Kanyama compound is one of the high-density areas of Lusaka with 60, 001 households and an HIV prevalence rate of 19% [18]. The area lies within the capital city of Zambia, situated about 1 km away from the main post office, South-West of the Central Business district. The total population is 96, 464, which is the Hospital catchment population, with 26, 045 women in the child-bearing age and expected pregnancies is 3, 518 per year. The actual number of deliveries in 2021 were 11, 077 [19]. The socio-economic activities in the compound include formal employment, small scale businesses and trading in various goods within and outside designated markets. The less privileged and vulnerable members of the community are usually identified by Community based Volunteers and these are contracted by stakeholders whenever employment opportunities arise. Sanitation and water drainage is poor in most of the areas of the compound, leading to frequent disease outbreaks, like cholera, especially during the rains. Originally built in 1977 as a clinic, Kanyama Hospital has evolved and provides health services to a catchment population that is divided into 11 zones and has an internal mobile phone system within the Lusaka district via Command post. The hospital offers preventive, curative and rehabilitative services in its In-patient and Out-patient Departments, and has a Maternal and Child Health Department which offers Antenatal, Labour and delivery, and Postnatal services with Comprehensive infant care. Other Integrated Sexual and Reproductive health services that are offered include; Family Planning, Comprehensive Abortion Care, prevention and treatment of Sexually Transmitted Infections including HIV/AIDS, cervical cancer screening, Voluntary Male Circumcision, Youth Friendly Reproductive Health services and

treatment of gender-based violence victims. George compound is a high-density area, lying 9.5 km from the main post office, with a population of 121, 087, and 32, 693 women in the child bearing age. The annual expected pregnancies are 4, 359, expected deliveries is 4, 359 per year. The socioeconomic activities in the area include formal employment, small, to large scale businesses. The crime rate is very high in the compound, with a lot of women smoking a kind of cigarette that is found in the area. The health centre also offers Maternal and Child Health services, and HIV counselling and testing with ART services. The study was conducted in private and quiet venues that were provided by the health facility In-Charges, mostly in the sister-In-Charge's offices. The study settings were chosen to provide diversity in demographic characteristics of participants, which might have an influence on how they cope with the stressful diagnosis of HIV infection made during pregnancy, and hence, how they bond with their babies.

Sampling Techniques

The health facilities were purposively selected. Purposive sampling was again used to select 17 participants out of the 110 who took part in stages 1 and 2 of the study, and these were interviewed at stage 3 of the study, which was conducted at 6 weeks post-delivery. The sampling considered participants who had different levels of stress and who utilised different coping strategies to take part in stage 3 of the study.

Participants

The study population were women seeking antenatal and postnatal care services at the study settings who tested HIV positive for the first time during their current pregnancy. Women were included in the study if they were pregnant and tested HIV positive for the first time at the booking visit during their current pregnancy and were willing to take part in the study. Seventeen of these same participants were interviewed after they delivered at stage 3 of the study. Women who were suffering from other complications or medical conditions during pregnancy, or experiencing any pregnancy danger sign during their second antenatal visit were excluded from the study. The researcher considered the stress levels and coping strategies identified among the study participants in stages 1 and 2 of the study to purposively select participants for stage 3, and selected participants across all the stress levels and coping strategies to provide diversity in women who were interviewed for mother-baby bonding.

Procedures

Data Collection Tool:

A self-constructed structured interview schedule was used to collect data. The interview schedule had three (3) sections. Section A comprised questions on the effects of the HIV diagnosis made during pregnancy as described by the women, and also had questions on the effects of the HIV diagnosis on mother-baby bonding. Section B solicited information on the coping strategies that women used after receiving an HIV positive diagnosis during pregnancy and had questions on the resistance resources that were available to the women. The resistant resources included support, which is psychosocial and medical support, and also physiological health.

Data Collection Technique:

Data were collected within a period of five (5) months, from August, 2022 to January, 2023 during the 6th week postnatal visit. The data collection instruments were always administered

after all the postnatal examinations for the visit had been conducted. A maximum of two (2) interviews were conducted per day, when participants were available for their 6th week postnatal care, until all the participants had been interviewed. A few of the interviews were conducted over the phone for participants who had travelled to deliver from other towns. The researcher began by measuring the stress levels and categorising the coping strategies, and afterwards, conducted the in-depth interviews. The interviews were tape recorded, to provide a backup and to allow information to flow freely without much disturbances which is brought about by so much writing as the participant is talking, and allowed for verbatim transcriptions after data collection. At the end of each interview, key points were summarized to the participant in order to verify the data. The researcher began by introducing self and reminding the participants about the purpose of the study, which had been fully explained in the earlier stages of the study. The participants did not have to sign a consent form at this stage, as it was already signed at stage 1 of the study. Face to face interviews were conducted each lasting 20 to 30 minutes in which participants explained the effects of an HIV positive diagnosis during pregnancy on their ability to bond with their babies. The languages that were used during the interviews were Chinyanja and English, which are the languages commonly spoken at the study setting, and the data collection tools had been translated into Chinyanja. The researcher conducted all the in-depth interviews, whereas stages 1 and 2 of the study also utilised trained Research assistants. The participants were thanked at the end of the interview, for their participation and were given a snack owing to the long period that they had spent at the health facility as they took part in the study. Participants at George Health centre were not given any snacks as per advice of the sister in charge who indicated that participants were suspicious of researchers who gave them food.

Ethics Approval:

Ethical clearance was sought from University of Zambia Biomedical Research Ethics Committee (UNZABREC); and written permission was obtained from the National Health Research Authority, Lusaka District Medical Office and from the study settings. The purpose of the study was explained to the participants and they were invited to take part in the study by signing a consent form during stage 1 of the study. Privacy was maintained at all times especially that HIV is a stigmatized condition, with anonymity and confidentiality upheld by using serial numbers, and not the names of participants on the data collection instruments. Counselling services were on hand for participants who broke down as they recalled their memories, though none of them agreed to utilise them. All tape-recorded interviews used reference numbers allocated to participants, and the verbatim transcription of the data were conducted in a private room to protect participants' anonymity and privacy.

RESULTS AND DISCUSSION

Data Analysis

After data collection, the data collection instruments were checked for completeness, and one interview schedule, where the participant declined to answer some of the questions was excluded, leaving a response rate of 94.1%. Thematic analysis was used to analyse data. The 6-phase coding framework for thematic analysis was used to identify themes and patterns in the data [20] as follows;

1. Familiarisation of data where the researcher read and re-read the data to familiarise herself with, and understand the data.

2. Generation of codes where the researcher generated the codes from the participants' transcribed verbatim. Several codes were generated.
3. Combining codes into themes in which the researcher grouped the similar codes into themes, and one main theme emerged after combining the codes, with four subthemes.
4. Reviewing the themes which involved the researcher reading and re-reading the themes to exclude any overlapping themes.
5. Determine theme significance in which the researcher rechecked the theme and determined its significance in light of the transcribed verbatim. During this stage, the researcher re-listened to the tape-recorded data to ensure that the theme was in line with what the study participants were saying.
6. Reporting of findings in which the researcher began report writing to report the study findings, having generated and reviewed the theme, and determining its significance.

Alphanumeric symbols were used to describe the study participants as presented in Table 1, and participants maintained their numbers as assigned at stage 1 of the study.

Table 1: Alphanumeric symbols used to identify participants in the study

SN	Research Participant	Alphanumeric Symbol
Chilenje Hospital		
1	Participant 5	P 5
2	Participant 7	P 7
3	Participant 9	P 9
4	Participant 13	P 13
5	Participant 14	P 14
6	Participant 17	P 17
7	Participant 18	P 18
8	Participant 21	P 21
9	Participant 23	P 23
10	Participant 28	P 28
11	Participant 39	P 39
12	Participant 40	P 40
13	Participant 44	P 44
14	Participant 45	P 45
15	Participant 49	P 49
George Clinic		
16	Participant 81	P 81
Kanyama Hospital		
17	Participant 104	P 104

The demographic characteristics for the participants are found in Table 2 and majority (15: 88.2%) of them were in the age group of 18 to 35 years with most (14: 82.4%) of them attending Protestant churches. A number of them (11; 64.8%) had attained secondary education and 13 (76.4%) resided in medium density areas. Their occupation was varied, with 7 (41.2%) being businesswomen and these were followed by a tie of 4 (23.5%) who were housewives and doing other activities to earn a living respectively. Among these, 6 of them (35.3%) earned between K1000.00 and K3000.00 per month followed by 5 (29.5%) who had negligible monthly income.

The majority (11:64.7%) of the participants were married with most (14: 82.4%) of them having 1 to 4 children and 13 (76.5%) of them having their 2nd to 4th pregnancies.

Table2: Demographic characteristics of participants at stage 3

Variable	Category	Frequency(n=17)	Percentage
Age	18-35	15	88.2
	36-49	2	11.8
Religious denomination	Roman Catholic	2	11.7
	Protestant	14	82.4
	Other	1	5.9
Level of education	no formal education	0	0
	primary	3	17.6
	secondary	11	64.8
	tertiary	3	17.6
Residential area	high density	2	11.8
	medium density	13	76.4
	low density	2	11.8
	village	0	0
Occupation	Housewife	4	23.5
	business woman	7	41.2
	formally employed	2	11.8
	other	4	23.5
Monthly income	below k1000.00	3	17.6
	k1000.00 to k3000.00	6	35.3
	above k3000.00	3	17.6
	negligible	5	29.5
Marital status	Single	6	35.3
	married	11	64.7
Health facility	Chilenje	15	88.2
	George	1	5.9
	Kanyama	1	5.9
Obstetrical characteristics			
Parity	None	3	17.6
	1-4	14	82.4
Gravidity	1 st	3	17.6
	2 nd to 4 th	13	76.5
	5 th and above	1	5.9

Before the in-depth interviews began, participants' levels of stress were measured again, and most (8:50%) of the participants had low levels of stress, probably because they had undergone their grieving process and had accepted their condition, with a determination to move on with their lives. However, 2 of them (12.5%) still had high stress levels which is detrimental to health, and may reflect utilisation of maladaptive coping strategies. The coping strategies were also categorised, and majority (10:62.5%) of them were using problem focused (problem solving) coping strategy where they were actively seeking solutions to live with their HIV positive status. However, 2 (12.5%) of them were using emotion focused coping which is not helpful in dealing with stressful conditions.

After thematic analysis one main theme emerged, with four sub-themes which described the effects of an antenatal diagnosis of HIV on mother-baby bonding (Table 3). The questions from which the themes emerged, focused on participants' experiences with being diagnosed HIV positive during a routine antenatal care visit, and bonding with their new-born. Participants gave several responses to these questions, upon which the sub-themes emerged.

Table 3: Thematic framework

	Main theme	Subtheme
1	Mother-baby interaction	1.1 Mother-baby relationship 1.2 Feeding method 1.3 Hurdles to mother-baby bonding 1.4 Cause of baby's death

Theme 1: Mother-Baby Interaction

The interaction between a mother and her baby is important for the psychological and physical health of both the mother and her infant and babies who have not bonded with their mothers usually show signs of distress. Mothers who have bonded with their babies are able to carry out caring functions on their babies, feel fulfilled and this leaves babies happy and fulfilled too. Mother-baby interaction can be determined by how the mother handles and takes care of her baby, and how the baby responds to that care. Breastfeeding is one of the activities that enhance bonding and improves the wellbeing of both mother and baby.

Mother-Baby Relationship:

The relationship between the mother and her baby is important for bonding of the mother-baby pair. The mother baby relationship can be enhanced or disturbed by the events that happen during pregnancy, labour and delivery, and even during the postnatal period. Participants were asked questions on how they cared for their babies and the bonding behaviours that were displayed like talking to the baby while attending to its needs, and the baby acknowledging the caring behaviour by smiling or being calm. Some participants described the effects of an HIV diagnosis on their ability to bond with their babies, which was generally positive.

Positive bonding behaviours were described by most of the participants who said, "as I attend to my baby's needs, I talk to him and sing for him and he responds by looking at me and smiling" (P 7, P 13).

Other participants described the activities that they carry out on their babies, and the strong bond of love that exists between them. P 17 had this to say; "I usually sing for her and she listens attentively. I love her very much" (P 17). Apparently, P 17 had contemplated abortion after receiving the HIV positive diagnosis.

More beautiful bonding behaviours were described by other participants, like P 39 who said, "we talk. We have a conversation mostly. We listen to music; I put for him and also sing to him. He responds by moving, listening and being calm" (P 39). In addition, P 44 said, "I stretch her, talk, and sing to her and she looks happy and looks like she understands. Our friendship is growing. Though I wanted to abort her, I feel connected to her from quickening, and it is heart-warming for me" (P 44). Participant 45 also recounted, "I talk to him. I remember when I had my first baby, my mother would say, 'talk to him' while you are caring for him, so I talk to him

and he responds by being active. I love him, it's a joy to have him" (P 45). This shows that the art of mothering often occurs through apprenticeship, where women learn how to bond with their babies from their own mothers. Other participants, though outwardly bonding with their babies, constantly feared for the baby, like P 81 who confessed; "I stretch him and play with him and he seems happy and smiles. I keep fearing, though, that I may infect him" (P 81). Still, some participants expressed inadequate bonding with their infants, like P 104, who said; "I don't do anything else to her as I am attending to her needs. After I bath her, she just sleeps". (P 104).

Feeding Method:

Breastfeeding enhances mother-baby bonding as it naturally causes the mother to be close to her baby during the feed. Babies too look straight into their mothers' faces as they breastfeed, enhancing the bond. Most mothers breastfeed their babies because breast milk is the recommended feed for human infants. Mothers who have tested HIV positive during pregnancy, or those who have a positive status prior to pregnancy may opt not to breastfeed to increase the chances of having an HIV negative child. When asked how they were feeding their babies and how long they take to feed the baby at each feed, participants made various descriptions. They were asked how long they took to feed the baby to determine if they were bonding adequately with their infants, as a mother who is not bonding will not spend a lot of time with their babies, and tend to hurry the feeds.

Participant 7 expressed her desire to have breastfed, but ended up bottle feeding due to some challenges and she had this to say;

I formula feed him because it is more convenient for me and I didn't have milk. I tried to breastfeed but nothing was coming out. But I wanted to breastfeed him, I tried for 2 days. So, I feed him 2 to 3 hourly and continue until he is full (P 7).

Other participants breastfed with the understanding that breast milk is the best feed for a baby as expressed by P 9, "I breastfeed him because it is cheap and it is the best. I breast feed him several times in a day and let him breastfeed until he is full" (P 9). Still, others breastfed upon encouragement from other people, as stated by one of them, "I breastfeed her because people encouraged me to breastfeed. I feed her several times in day until she is full" (P 17).

For mothers who have undergone a Caesarean delivery, midwives may breach the feeding plan which the mother established during pregnancy as the mother may be asleep due to anaesthetic effects. P 13 had this to say;

I breastfed initially but produced no milk then I started bottle feeding. During pregnancy, I told the health care workers that I would just bottle feed to reduce the risk of transmitting the virus. But after my Caesarean Section, they had put the baby to the breast while I was still sleeping, but milk didn't come out so I resorted to formula feeding. I feed him several times in a day until he is full (P13).

More responses were given by participants concerning their feeding methods as follows; "I use artificial milk and bottle-feed him. I think it is better so that I don't infect him with the virus. I feed him 6 to 7 times in a day until he is full" (P 14)

Other participants breastfed for fear of stigmatisation and had this to say;

I breastfeed him because I feared people, thus family and neighbours, that if they see me not breastfeed, they will know that I am positive and stigmatise me. I feed him 3 times in a day until he is full (P 21).

This shows an inadequate bonding behaviour where the participant restricts breastfeeding to only 3 times a day, and it just satisfies the mother's ego.

Still, others had some good reasons for breastfeeding, though still fearing to infect the baby, and explained their feeding choice as follows;

I breastfeed him because if not breastfed, bana bankala nachikonko ngati sibanyonka nakudwaladwala (they feel hurt if they don't breastfeed and they become sickly). I was also told that there is no risk if I am on ARVs. I breastfeed several times in a day till he is full.... But I fear to infect him through breast milk (P 23).

Some of the participants breastfed because they were informed to do so at the hospital, and one of them had this to say, " I breastfeed because I was informed to breastfeed at the hospital. I breastfeed him 3 times per day because I go to sell goods at the market. But I breastfeed him as long as he wants at each feed" (P 28). This shows inadequate feeding for a baby less than six weeks old. Other participants breastfed, but had put measures in place, which were driven by fear of infecting the baby. P 39 explained her situation as follows;

I exclusively breastfeed him, eeeeh, I thought it was the best for him, for now I can breastfeed up to 6 months then I will stop breastfeeding completely if his next test will be HIV negative. I breastfeed him 4 times. He sleeps for 2 hours and whenever he wakes up, he breastfeeds for about 15 to 20 minutes and then he sleeps again (P 39).

Sometimes, Health care workers may not adequately explain the feeding choices to the mothers as depicted in the following conversation with P 45;

I breastfeed my baby. Asked why she chose this method of feeding, she was surprised and said, "I thought that is the only way??? Or is there any other option? Coz I was thinking that maybe after 4 months I stop breastfeeding and introduce the bottle when my maternity leaves end. I breastfeed most of the time, like more than 10 times in a day, and sometimes I feed until the milk finishes in one breast. But sometimes on changing breasts, then he stops sucking (P 45).

Participants also expressed disappointment in the health care system with regards late receipt of their Viral Load results which affected their feeding decisions. When asked how she fed her baby, P 49 said, "I formula feed him using the bottle, because the time I gave birth, it was in December, so I didn't know my latest Viral Load (VL). I was due for the VL the next visit. P 49 further expressed anguish at not being able to breastfeed as follows;

But after the results, it was now too late to breastfeed, though I had really wanted to breastfeed because breast milk is the best. Like now, my baby cries a lot because he has colicky pain which he would not have if he was breastfeeding. When I am late to prepare his milk, he cries a lot and I feel bad. I wish I could breastfeed, but I didn't know my Viral Load. I feed him several times in a day until he is full (P 49).

Others explained their feeding methods, combining it with the reason for adhering, though still fearing to infect the baby as stated by P 81 in the following statement;

I breastfeed him because I was told that it is okay to breastfeed since both the baby and myself are on ARVs. I took the drugs so that he is born well, but I feel bad, that I may infect him (P 81).

Further, the reason for wanting to stop breastfeeding early was given by P 81, which still indicated the women's mixed feelings about prevention of Mother-to-Child transmission of HIV while taking ARVs. P 81 planned to wean the baby off the breast early and said, "so I want to stop breastfeeding when his teeth erupt *kaili apa* (because now) I know that I am positive, and I may infect him if he bites the breast while breastfeeding" (P 81).

Hurdles to Adequate Mother-Baby Bonding:

Mother baby bonding was not without challenges among participants. Mothers expressed the fears that they had with getting too close to their babies which included fear of infecting the babies and also fear that the baby will die. Participants explained their haunting fear of the potential to infect their babies, as one of them said, "in my thought of thoughts, I still fear that the baby will contract the virus" (P 17), and this was resounded by another participant who stated, "I think a lot of thoughts about my baby. Will she grow up? I pray always that she will not be infected" (P 104). Participant 21 also expressed her fears as she explained, "I feed the baby less often because I fear constantly that I will infect him. Even if the hospital told me that I could safely breastfeed if on ART, I fear constantly" (P 21). More mixed feelings were expressed by the participants as stated in the following statement by one of them;

I just don't want him to acquire this. I just have that ka (small) fear, may be through breastfeeding, I can infect him, though they say it's not...I just want my baby to be okay (P 45).

Still, others could not bond adequately because they feared that their babies would die as some of them said, "I think that my baby will not live and it affects my relationship with him" (P 104). Yet, others feared for their own lives as stated by some of them, "I have fears about leaving my child, 'coz' I want to see him grow up, I want to see him become something in future, get married, so that he achieves his goals, that's what I pray for" (P 49).

Cause of Baby's Death:

Some mothers had no chance to bond with their infants because the babies died. Of the participants who were interviewed at stage 3 of the study, two of the women lost their babies and they had this to say;

I aborted at 7 months while I was on duty, the baby never cried at birth. I suffered from high blood pressure because I was thinking too much about pregnancy outcome when I was told that I was HIV positive to the extent that I developed high Blood Pressure. I lost my appetite and never felt hungry (P 5).

Another participant who lost her baby expressed her sorrow and said;

I was admitted at 6 months for pre-eclampsia. I developed high blood pressure during pregnancy, I think the news of HIV contributed to the high blood pressure. The baby died in the 'stomach' with inducing medicine, he weighed 750g. I felt overloaded, I had too much medication and it was too much for me. Death of baby affect me, I was induced and experienced a lot of pain (P 40).

DISCUSSION

Mother-baby bonding is critical in the normal growth and development of a child, and bonding begins during pregnancy, way before a baby is born [22, 1]. Participants described their experiences with mother-baby bonding, with most of them describing positive bonding behaviours. They reported engaging with their babies as they cared for them, which made the babies respond positively too. Participants wished for the very best for their babies and wanted them to be HIV negative and grow up to become responsible members of society. They became particularly encouraged with an HIV negative test result on their baby, and were optimistic that their babies could grow as HIV negative persons. However, participants also reported inadequate bonding which resulted from the stress of an HIV diagnosis and mostly fear of infecting the baby, or fear that the baby would die. Willcocks et al explored the impact of being diagnosed with HIV during pregnancy on mother-infant bonding using Grounded theory. The study findings highlighted the challenges with bonding which emerged during the early stages of diagnosis and postpartum but mothers became resilient and positive as infant testing progressed. The study called for timely information regarding vertical transmission and more support to women diagnosed positive during pregnancy [21]. The current study similarly found problems with bonding especially during pregnancy by some of the participants. Other participants had fears to bond adequately with their babies, like P 104 who feared that her baby would die any time and this affected her relationship with him, not wanting to get emotionally attached to him to avoid heartbreak. Participant 17 had problems bonding with her unborn baby as she felt like the pregnancy was the cause for her HIV positive status, as, according to her, before this she was just okay. She reported wanting to abort the baby, and more so because she believed that the baby, being HIV positive too, would die anyway. A number of the other participants described unhappy feelings towards the pregnancy as it was seen as the cause of the diagnosis. This is not a healthy bonding behaviour as bonding begins during pregnancy [22, 1]. It is therefore critical to recognise confusion and stress in pregnant women diagnosed with HIV to reduce their stress and help them bond adequately with their babies. The confusing thoughts and stress are real in the women who are diagnosed HIV positive during pregnancy, which is an already stressful state. Breastfeeding usually enhances bonding due to the close contact between mother and baby during a feed [23, 24]. This study found that most of the women breastfed their babies and had the rewarding maternal feeling of caring for their babies and watching them grow daily. However, similar to a study conducted by Umeobieri et al. (2018) some of them, like P21 breastfed for wrong reasons, like fear of stigmatisation if they

were not seen breastfeeding as people would conclude that they were HIV positive [25]. This is not helpful for both mother and baby as breastfeeding should be honest and enjoyable. Participants recommended that community members should be encouraged to mind their own business as opposed to always checking on what their neighbours were doing.

The breastfeeding experience also brought out some facts regarding staff where some participants lacked knowledge on the feeding options for HIV positive women. Some participants expressed surprise to hear that there were other feeding options for an HIV positive mother apart from breastfeeding. As much as breastfeeding is the best method and enhances the bond between the mother and her baby, it is important that mothers are given the feeding options during antenatal care so that they make an informed choice, which should be written down to ensure that it is followed. The Ministry of Health could also include infant feeding counselling during antenatal care, which is only mentioned in the postnatal care package [13]. Another participant expressed displeasure at the midwives who put her baby to the breast in her post Caesarean section drowsiness, when she had informed the health care workers that she would not breastfeed. The mix-up could have occurred if the participant had informed any other Health care worker apart from Midwives who usually attend to women's labour and delivery, or simply because her feeding choice was not documented on her antenatal record. It is important that the feeding method which a mother settles for, is documented to avoid mistakes. Women also complained about late Viral Load results that would not be available as they delivered. According to the participants, knowing their viral load could have helped them assess their own suitability to breastfeed without the fear of infecting their babies during breastfeeding. The Zambia consolidated guidelines on management of HIV guides that viral load should be checked every 3 months for HIV positive pregnant and breastfeeding women [13]. Unfortunately, the 3 monthly viral load checking may not be on schedule as the woman delivers, depending on which gestation period the viral load checking began. Therefore, Health care workers should individualise the Viral Load testing for each woman to help them make informed feeding choices. Most mothers are aware that breast milk is the best feed for their baby regardless of their HIV status, and that breastfeeding enhances bonding with their babies (P 9, P 23, P 49). It is important that staff support mothers to bond with their babies to ensure their healthy growth and emotional stability.

CONCLUSION

The study has provided information on mother-baby bonding in women diagnosed HIV positive during pregnancy. The results revealed that most of the mothers bonded positively with their babies, though some of them reported inadequate bonding as they feared to infect them, or that their babies would die. Other participants had no chance to bond as their babies died due to complications of pregnancy which the mothers attributed to the stress caused by an HIV positive diagnosis during pregnancy. Hence, there is need to support mothers psychologically to help them cope with the stress of an HIV positive diagnosis during pregnancy and enhance mother-baby bonding.

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