Author’s response to reviews

Title: Sexual and reproductive health behavior and unmet needs among a sample of adolescents living with HIV in Zambia: a cross-sectional study

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Author’s response to reviews:

Reviewer #1:

This paper has a potential to be accepted, but some points have to be clarified or fixed before a positive action can be taken.

We here summarize these points:

1. Abstract: "little evidence is available on their sexual behaviors and SRH needs in Zambia": Rationale to conduct this research is to be transferred to the end of the introduction in the text.

   [Response]
   We revised the rational to conduct the research, and stated in the introduction section (lines 132-136).

   Although HIV care and treatment services have become widely available in the country, the existing services do not address challenges and needs of adolescents adequately. Particularly,
limited evidence is available on sexual behaviors and SRH needs, and the quality of care in this area remains underdeveloped.

2. Primary and secondary aims of the study to be clarified in the background section of the abstract and in the text.

[Response]

We revised the objectives of the study in the abstract and the main text.

Abstract (lines 26-28)

This study aimed at assessing their sexual behaviors and SRH needs and identifying factors associated with marriage concerns and desire for having children.

Introduction (lines 136-138)

We conducted this study to assess sexual behavior and SRH needs among adolescents living with HIV in Zambia and to identify factors associated with having concerns about marriage and desire to have children.

3. Methods: line 129

Study setting: The two centers are the national referral centers and the model hospitals for adolescent HIV care and treatment services

Are these two centers regarded as the main health center related to HIV, are they covering all cases diagnosed to have HIV in Zambia, in another words is there another center where the adolescent can seek to be managed there, and what is the rate of covering is for this purpose by the 2 national centers.

[Response]

The two centres in the University Teaching Hospital are the central facilities providing HIV care and treatment services in the country. However, they do not cover all cases of HIV because more
than 870 health care facilities provide HIV care and treatment services across the county. Although we could not obtain the accurate data on the total number or rate of patients covered by the two centres, we added the following information.

(lines 128-132)

More than 870 health care facilities provided HIV care and treatment services across the country [32], and 67% of adults and 52% of children were receiving ART in 2016 [3]. The University Teaching Hospital is the central hospital in the capital city of Lusaka, which houses the Paediatric and Adult Centers of Excellence in HIV care and treatment.

4. In the title :it is better to add the word (a sample) before adolescent :

Sexual and reproductive health behavior and unmet needs among a sample of adolescents living with HIV in Zambia: a mixed-methods study among adolescents living with HIV in Zambia: a mixed-methods study

[Response]
We revised the title as suggested.

(lines 1-2)

Sexual and reproductive health behavior and unmet needs among a sample of adolescents living with HIV in Zambia: a cross-sectional study

5. Tables : (pa ,AORb (95%CI)c) : No need to add a superscript letters for the abbreviated words (a,b,c)

[Response]
We deleted the superscript letters on the Tables.
6. Discussion 281: The beginning paragraph is the aim of the study and ended by to references which are not understandable why they are here. Start your discussion with a paragraph showing the main finding of the study. The section contains many repeated rates of the results, please revise them and try to discuss the results and to explain why.

[Response]

We deleted the aims of the study stated in the first sentence of the discussion section and started the paragraph with the main findings. We also deleted the repeated rates of the results. However, we provided a summary of the findings, and discussed the detail of the findings after the first paragraph.

(lines 316-321)

Twenty percent of the adolescents in our sample had experienced sexual intercourse, and at least 30% of them did not use a condom during the first intercourse. Nearly half of the adolescents expressed concerns about their future marriage. In contrast, the majority of them desired to have their own children in the future. Those who desired to have children were more likely to worry about their marriage. To the best of our knowledge, this is the first quantitative evidence built on existing study findings in Zambia [30, 31].

Reviewer #2:

This is a paper of interest however there are few points that need to be considered by the authors:

1. Title and abstract are OK

[Response]

We revised the title according to the suggestion by Reviewer#1.

Sexual and reproductive health behavior and unmet needs among a sample of adolescents living with HIV in Zambia: a cross-sectional study
2. Introduction is long and patchy but also lacks the details on the context and the hospitals/Centres of excellence and their services.

[Response]

We revised the introduction section based on all reviewers’ comments.

We added information on the number of health care facilities providing HIV care and treatment services across the country, and the information on the operations of the University Teaching Hospital in the Background and the Methods section.

(In lines 128-132)

More than 870 health care facilities provided HIV care and treatment services across the country [32], and 67% of adults and 52% of children were receiving ART in 2016 [3]. The University Teaching Hospital is the central hospital in the capital city of Lusaka, which houses the Paediatric and Adult Centers of Excellence in HIV care and treatment. (In lines 144-146)

The two centres equip various specialists and infrastructure to provide care, laboratory test, treatment, counselling, social welfare services, and support peer group activities.

(In lines 149-154)

Health care workers routinely offer information on SRH to all the adolescents aged 10 years or older when they attend their routine clinical reviews. For adolescents who reported risky sexual behaviors during a regular clinical review, health care workers provided counselling services on the details of SRH and family planning methods, gave them with condoms, and suggested that they go for a free counselling and testing service for HIV with their partners.

3. Methods: It was confusing on how data were collected as the main methods was self-administered questionnaire but then some interviews were conducted for those who lacks the literacy. Also it was not clear who carried out the interviews; training, gender, etc. The pretesting of the English literacy was not clear. More details on data analysis is also needed.
We stated the details of how we developed the questionnaire, collected data from the target participants regardless of their English literacy, and ensured the data quality.

(lines 177-185)

We developed the questionnaire in English because the study sample used English daily. Before the survey, we conducted a pre-test of the questionnaire to assess their English literacy, edited the questionnaire using simple English, and confirmed that the majority could self-administer the questionnaire. We trained research assistants who were peer educators working for adolescents’ HIV care program in the study site. During the survey, respondents could ask the same-gender trained research assistants to help read-out in English or provide verbal translation into local language. Those who could not administer the questionnaire had an interview with the same-gender trained research assistants and responded everything except questions about sexual behavior.

We also stated the detail of participants who were excluded from analysis.

(lines 238-240)

We recruited 200 eligible adolescents in the study. We excluded two adolescents who withdrew during the survey and 15 adolescents who did not respond about their sexual behavior due to limited English literacy or voluntarily declined to answer.

We provided more details on data analysis.

(lines 208-214)

For quantitative data, we first compared the distributions of background characteristics of the adolescents, their sexual behavior, and SRH issues using chi-square test. We then identified factors associated with having concerns about marriage and desire to have children by using the Generalized Linear Model. We included age, gender, education level, survival statuses of their parents, having someone to talk to about SRH issues, and having learned about four topics on SRH as independent variables of the models based on the existing literature [14, 23, 31, 33] and estimated crude and adjusted relative risks (RRs).

(lines 216-217)

We analyzed all the quantitative data using Stata 13 (College Station, TX: StataCorp LP).
We manually analyzed all the qualitative data.

4. Results: The presentation of the thematic analysis was not clear

[Response]

We revised the presentation of the thematic analysis as follows:

(lines 283-286)

The four major themes that emerged were: disclosing HIV status to partner, options in marriage, HIV transmission to partner and children. Adolescents were anxious about how to disclose HIV status to their intimate partners and their reactions afterwards.

(lines 301-302)

From the thematic analysis, four major reasons emerged: desire for parenting, children as family assets, positive perception on children, and natural matter.

5. Discussion: the second limitation is strange as it contradicts with the ethical considerations. It should be part of the informed consent

[Response]

We moved the second limitation to the section of ethical considerations, and explained the detail procedure of informed consent.

(lines 230-236)

We anticipated that adolescents may feel pressured to participate in the study as we recruited them at the hospital where they were receiving care. In addition, they may hesitate to respond about sexual behavior if they suspect the individual data could be shared with the hospital staff. To address these potential issues, we informed each adolescent about voluntary participation without any harm if they avail of care in the future and confidentiality in data management.
Reviewer #3:

The authors investigated sexual and reproductive health behaviors and needs among HIV-positive adolescents in Zambia. This manuscript is notable in that it addresses a crucial issue in an important and neglected population: sexual behaviors among HIV-positive adolescents in Zambia. Overall, this manuscript would benefit from a thorough editing of grammar and language. I have provided detailed comments on specific aspects of the manuscript that I believe require attention below:

Overall, this manuscript would benefit from a thorough editing of grammar and language.

[Response]

We had a professional editing of grammar and language. If we need to edit the manuscript furthermore, please let us know. We changed the language from British English to American English, but we described the study sites in British English as they are the original names; Paediatric HIV Centre of Excellence and the Adult HIV Centre of Excellence.

1. The title of this manuscript states that this is a mixed-methods study. I am not sure whether the use of only one methodology (a survey) qualifies as mixed-methods?

[Response]

We changed the study design to a cross-sectional study (lines 2, 29, 141).

2. The authors state in the Background section that rapid physical and psychosocial development during adolescence could complicate challenges related to sexual and reproductive health (line 86). The authors should also include some discussion of how delayed development (e.g. delayed pubertal onset, which is common among perinatally-infected adolescents) may impact sexual and reproductive behaviors
We added some existing evidence about delayed puberty and the potential impact among perinatally-infected adolescents in the Introduction section.

(lines 87-90)

In addition, delayed puberty onset is commonly observed among perinatally-infected adolescents, which can result in low self-image, depression, and reproductive consequences [12]. For example, they make themselves targets for sexual abuse or they may easily engage in sexual intercourse to prove their worth.

3. In lines 88-91, the authors present data on sexual behaviors among HIV-positive adolescents in other settings. The authors should include information about the age of the adolescents in these samples in order to allow a comparison with their results.

[Response]

We added information on the age range of adolescents and young adults in other settings.

(lines 91-95)

In high-income counties, 27–46 % of adolescents and young adults (ages 13-24) living with HIV have experienced sexual intercourse [13-16]. In low- and middle-income countries, it is less prevalent; for example, 25% of Ugandan adolescents and young adults (ages 11-21) and 5% of Thai adolescents (ages 11-18) living with HIV have experienced sexual intercourse [17, 18].

4. In line 106, the authors state that fertility intention was "high" among adults. The authors should be more specific and present results in terms of what proportion of adults intend to have children.

[Response]

We added the specific rates of fertility intention and rephrased the sentence.
Although few studies have assessed adolescents’ fertility intention in African countries, the rates of fertility intention among male and female adults were ranged between 37 – 51%, and the fertility intention was higher among those who were younger, had fewer children, were taking ART, and perceived themselves to have good health status [23–25].

5. In lines 117-118, the authors state that "a major route of HIV transmission in early adolescence is maternal transmission". This sounds as though transmission is occurring when these children are young adolescents (i.e. not during pregnancy/postpartum) and should be rephrased.

[Response]
We rephrased as follows:

(lines 122-124)

The majority of young adolescents contracted HIV through mother-to-child transmission [27] whereas older adolescents are more likely to get HIV infection through sexual transmission or other routes [4].

6. In lines 119-121, the authors state that adolescents "share common characteristics". It is unclear what this means. Do the authors mean that these behaviors are common among adolescents? Not all adolescents will experience the health outcomes listed.

[Response]
We rephrased the sentence as follows:

(lines 124-126)

Major adolescent health issues in the country are lack of knowledge about HIV, early initiation of sexual intercourse, sexually transmitted diseases, and teenage pregnancy [28, 29].
7. The authors refer repeatedly to "concerns about marriage". It is unclear what this means and how it was assessed. Further details should be provided in the Methods section.

[Response]

“Concerns about marriage” means any “concerns” or “anxieties” related to getting or being married in the future that adolescents had at the time of survey, which we assumed to be affected by their HIV positive status. During the survey, we provided a structured question first, followed by an open-ended question to clarify their concerns or anxieties.

(lines 201-206).

The study outcomes were having concerns (or anxieties) about marriage and a desire to have children in the future. First, we provided a structured question of “Do you have any concerns about marriage?” in the questionnaire, and then asked to administer their specific concerns with a single English sentence. In the same way, we asked another structured question of “Do you want to have children in the future?” followed by asking their reasons for wanting children.

8. Did the authors collect data on the route of HIV infection? This would be a crucial predictor of sexual behavior, and all adolescents infected through sexual transmission would, by definition, have a history of sexual behavior.

[Response]

We could not collect data on the route of HIV infection because no reliable source of data on the route of HIV infection, such as the medical record or database, were available. We agree that this is an important factor. We attempted to estimate the route of HIV transmission among 36 adolescents who reported having ever had sexual intercourse. We found that 12 (33.3%) may be vertically transmitted as they had known their HIV status or started ART before the first sexual intercourse, 5 (13.9%) may also be vertically transmitted as they have known HIV status or started ART by the age of 10 years, 10 (27.8%) may not be vertically transmitted as they knew their HIV status or started ART after the first sexual intercourse, and 9 (25.0%) were unknown. We decide not to report these data in the manuscript because they are estimated data.

We stated about the lack of data on the route of HIV transmission in the limitation section.

(lines 384-388)
Third, we did not collect data on marital status or route of HIV transmission, which could influence to sexual behavior. Further studies at multiple sites with various target populations would be recommended, and sub-group analysis by geographical area, compliance with care, marital status, and the routes of HIV transmission could provide the study results more clearly.

9. In Table 2, there appears to be a lot of missing data, for example 15 adolescents did not report their age at first sexual intercourse, and 17 did not report their partner's age. This has major implications for the validity of findings, and should be addressed. Many variables also include a high proportion of adolescents who declined to answer. What implications does this have for the validity of these results?

[Response]

We agree with the reviewer’s comment. However, we had to respect the study participants’ decision to choose to answer or not, whereas we did not have other methods of data collection that can completely protect confidentiality of participants, such as computer-assisted survey tool. Therefore, the high proportion of missing data on sexual behaviors may underestimate the results, and we should carefully interpret the results when comparing to the results in other settings. We explained about this in the limitation section.

(lines 290-292)

Thus, the study findings could be under-estimated and should not be simply compared with results in other settings. The future study needs to use anonymous survey methods, such as computer-assisted survey.

10. The two outcomes of interest in this analysis were frequently reported (49% of adolescents reported concerns about marriage, and 87% reported a desire to have children). Given that the outcome is common, logistic regression may not be an appropriate method of analysis. Did the authors consider using other regression models?
We reconsidered and changed the statistical analyses method to the Generalized Linear Model. We revised the data analysis procedures in the Methods section, and updated the Abstract, the Results section, Tables 4 and 5.

[Methods in Abstract] (lines 32-33)

We used the Generalized Linear Model to identify factors associated with having concerns about marriage and desire to have children.

[Results in Abstract] (lines 38-42)

Marriage-related concerns were high among those who desired to have children (adjusted relative risk [ARR] = 2.51, 95% CI = 1.02 to 6.14). Adolescents who had completed secondary school were more likely to desire to have children (ARR = 1.35, 95% CI = 1.07 to 1.71). Adolescents who had lost both parents were less likely to want children (ARR = 0.80, 95% CI = 0.68 to 0.95).

[Methods](lines 209-211)

We then identified factors associated with having concerns about marriage and desire to have children by using the Generalized Linear Model.

[Results] (lines 267-274)

Adolescents who wanted to have their own children were more likely to have concerns about their future marriage compared with those who did not desire to have children (Adjusted RR [ARR] = 2.51, 95% CI = 1.02 to 6.14). Table 5 shows the factors associated with desiring to have children (n = 175). The adolescents who had completed secondary school or higher were more likely to desire to have children than those who had not completed primary school (ARR = 1.35, 95% CI = 1.07 to 1.71). Adolescents whose parents were both dead were less likely to desire to have children compared with those whose parents were both alive (ARR = 0.80, 95% CI = 0.68 to 0.95).
11. The authors should include a justification for their model building approach, for example why they decided to adjust for particular variables in the adjusted models.

[Response]

We selected independent variables based on existing literature. Due to the small sample size, we selected the minimal number of independent variables that would be related to the study outcomes, and could be helpful for the future interventions in the study site. We included all independent variables in the models to control for confounding factors. We revised the model building approach as follows:

(lines 211-214)

We included age, gender, education level, survival statuses of their parents, having someone to talk to about SRH issues, and having learned about four topics on SRH as independent variables of the models selected based on the existing literature [14, 23, 31, 33], and estimated crude and adjusted relative risks (RRs).

12. Did the authors explore the impact of age on the outcomes of interest? This would seem an important variable to consider. I also recommend adjusting all models for age.

[Response]

We did not included age in the initial analysis because the age range of the study sample was narrow. This time, however, we included age as a continuous variable in the all models, and updated the results (Tables 4 and 5).

13. In Table 5, the confidence intervals are extremely wide for some categorical variables because of the low number of adolescents in each category (for example, educational experience). Did the authors consider collapsing these variables into fewer categories?
We employed the Generalized Linear Model (GLM), by which we identified the same significant factors in the previous analyses, and provided narrower confidence intervals. We also reconsidered collapsing the variable of educational experience, and performed the analysis. We decided to use the initial variable with three categories because the GLM provided narrow confidence intervals, and we believe that the comparison among the three educational levels has an important implication for the results in the local setting (Tables 4 and 5).

14. The authors should include details of what services were offered to adolescents reporting risky sexual behaviors in this study.

[Response]
We did not provide any services to the adolescents who participated in the study and reported risky sexual behavior in the questionnaire, because this was an anonymous survey. However, health care workers at the study site offered the following services to adolescents who reported risky sexual behaviors.

(lines 150-154)
For adolescents who reported risky sexual behaviors during a regular clinical review, health care workers provided counselling services on the details of SRH and family planning methods, gave them condoms, and suggested that they go for a free counselling and testing service for HIV with their partners.

15. The authors should also include details of what sexual and reproductive health services are routinely offered to HIV-positive adolescents in this context. For example, do health care workers routinely discuss sexual and reproductive health issues with adolescents who are engaged in HIV care?
Health care workers routinely offer information on SRH to all the adolescents aged 10 years or older when they attend their routine clinical reviews.