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Cervical Cancer Screening Service Utilization and Associated Factors Among Women Living With HIV Receiving Anti-Retroviral Therapy at Adama Hospital Medical College, Ethiopia

Zubeyda Kedir Mohamed, MSc[1], Yirga Wondu Amare, MSc[2], Mihiret Shawel Getahun, MPH[3], Yohannes Mekuria Negussie, BSc[4] and Abenet Menene Gurara, MSc[5]

Abstract

Introduction: Cervical cancer is the second highest cause of cancer-related mortality in the world, and it is one of the top 20 causes of mortality in Ethiopia. Even though cervical cancer is more common among women living with HIV, the utilization of cervical cancer screening services remains low in Ethiopia.

Objectives: This study aimed to assess cervical cancer screening service utilization and associated factors among women living with HIV receiving anti-retroviral therapy at Adama Hospital Medical College, Ethiopia.

Methods: An institution-based cross-sectional study was conducted among a sample of 304 women living with HIV from 1st–30th June 2022. Data were collected using an interviewer-administered questionnaire. The data were entered into Epi info version 7 and exported to SPSS version 25 for analysis. Bi-variable logistic regression analysis was used to identify candidate variables at $p < .25$. Finally, multivariable logistic regression analysis was used to identify the independent predictors of cervical cancer screening service utilization at $p < .05$ with 95% confidence intervals.

Results: The magnitude of cervical cancer screening service utilization was 26.9% (95% CI: 22.0, 32.6). Being a government employee (AOR: 8.09, 95% CI: 1.5, 41.19), having a family history of cervical cancer (AOR: 3.4, 95% CI: 1.02, 11.9), being aware of cervical cancer screening (AOR: 3.75, 95% CI: 2.11, 14.7), having a history of sexually transmitted infection (AOR: 3.14, 95% CI: 1.95, 10.2), and heard about cervical cancer (AOR: 2.6, 95% CI: 1.05, 6.41) were associated with cervical cancer screening service utilization.

Conclusion: The magnitude of cervical cancer screening service utilization was low. It was associated with occupation status, family history of cervical cancer, awareness about cervical cancer screening, history of STI, and ever heard about cervical cancer. Thus, to maximize utilization, health education programs and other multidisciplinary strategies had to be implemented.

Keywords

cervical cancer, utilization, screening, utilization, women living with HIV, Ethiopia

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Introduction

Cancer is a disease in which cells in the body grow out of control and when starts at the cervix, it is called cervical cancer (CC) (Health et al., 2006). CC is the most prevalent Acquired Immune Deficiency Syndrome (AIDS) related malignancy in women and a key disease that characterizes AIDS. In 2020, Worldwide the incidence and mortality of CC were estimated to be 604,000 and 342,000, respectively, making it the most frequent cancer among women globally

[1]Department of Midwifery, Rift Valley University, Adama, Ethiopia
[2]Department of Midwifery, Arsi University, Asella, Ethiopia
[3]Department of Nursing, Adama General Hospital and Medical College, Adama, Ethiopia
[4]Department of Medicine, Adama General Hospital and Medical College, Adama, Ethiopia
[5]Department of Nursing, Arsi University, Asella, Ethiopia

Corresponding Author:
Mihiret Shawel Getahun, Department of Nursing, Adama General Hospital and Medical College, Adama, Ethiopia.
Email: mreshawe1987@gmail.com

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(Sung et al., 2021). It is the second-leading cause of female cancer in Africa, with an estimated 119,284 new cases and 81,687 deaths per year (Bruni et al., 2019). While incidence, prevalence, and mortality rates of CC are rising globally (Bray et al., 2018), around 90% of CC fatalities take place in low- and middle-income nations (Kamath Mulki & Withers, 2021).

In sub-Saharan Africa, the estimated incidence of CC was 25.2%, the mortality rate was 23.2%, and the prevalence was 27.6% (Sung et al., 2021). In Ethiopia, CC is estimated to affect 23% of women per 100,000 people each year, with incidence, death rate, and prevalence rates of 17.3%, 16.5%, and 18.2%, respectively (Mekuria et al., 2021).

Review of Literature

Numerous studies have shown that women living with Human Immunodeficiency Virus (WLHIV) have higher human papillomavirus (HPV) prevalence rates as well as infections with several high-risk HPV strains (Dimie et al., 2022). Additionally, they have a higher chance of developing a CC (Stewart & Wild, 2015). A CC caused by HPV and HIV is also facilitated by a variety of factors, including clinical, socioeconomic, reproductive, and behavioral-related factors (Katia et al., 2009).

CC is a potentially preventable and treatable form of cancer, so morbidity and mortality could be reduced with early detection and effective management (Finocchario-Kessler et al., 2016). A variety of screening methods are available, including HPV DNA testing, cytological tests, and visual inspection tests (Lim & Ojo, 2017). For women, as soon as they are identified as HIV-positive, World Health Organization advises the need for CC screening (Nega et al., 2018).

In Ethiopia, as in other resource-constrained settings, the CC screening strategy preferred the visual inspection with acetic acid (VIA) testing method to detect cervical lesions. In comparison to the HPV test and cytologic or Pap smear, the VIA test method was chosen as it does not necessarily require more advanced testing standards (e.g., trained cytotechnicians or pathologists and other programmatic requirements (Fentie et al., 2020). In a project called "Addis Tesfa" CC Prevent Project, Pathfinder International Ethiopia introduced a one-visit strategy of pre-cancer VIA screening and cryotherapy for WLHIV (Assefa et al., 2019) and the Ethiopian ministry of health also took certain steps to increase awareness and coverage of CC screening. For instance, a cancer registry was completed in Addis Ababa and nearby regions in 2015 to address the consequences of CC and improve cancer surveillance, registration, and research. The effort was publicized in the media and is still ongoing ("FMOH. National cancer control plan. 2016–2020. Ethiopia; 2016,"; Kasa et al., 2021).

Different studies have shown that the use of CC screening tests in Ethiopia remains inadequate. A nationwide community-based cross-sectional survey conducted in 2015 discovered an extremely low rate of cervical screening (2.9%). Even though over 534,000 Ethiopian women had HIV (WHO, 2013), only 15,263 of this high-risk population were screened for CC between 2010 and 2013 (Salvador-Davila et al., 2014). Recent studies in Ethiopia, Tigray (Gebrekirstos et al., 2022), Gondar (Nega et al., 2018), and Addis Ababa (Emru et al., 2021), among HIV-positive women, also revealed low rates of screening service utilization (8%), (10%), and (25.5%), respectively. Therefore, this study aimed to examine CC screening service utilization and its associated factors among WLHIV receiving ART at Adama Hospital Medical College (AHMC), Ethiopia.

Methods

Design

An institution-based cross-sectional study was conducted among WLHIV receiving ART at AHMC from 1st–30th June 2022. Adama town is located in Oromia regional state, East Shewa zone at a distance of 99 km from Addis Ababa. In the town, the health services include 7 health centers, 160 private clinics, 4 private hospitals, and 1 governmental hospital with 70% of health service coverage of health facilities. AHMC is the biggest and the only governmental hospital in Adama city that provides CC screening services for women including WLHIV on voluntary bases.

Research Questions

1. What is the magnitude of the use of CC screening service utilization WLHIV receiving anti-retroviral therapy at Adama Hospital Medical College, Ethiopia?
2. What are factors that are associated with CC screening service utilization among WLHIV receiving anti-retroviral therapy at Adama Hospital Medical College, Ethiopia?

Sample

The sample size for this study was calculated using a single population proportion formula by considering a 95% confidence interval, a margin of error of 5%, and a proportion of CC screening service utilization among WLHIV from a study conducted at Hawassa (Assefa et al., 2019). By adding (5%) for the non-response rate the final sample size was 304.

Out of all clients receiving ART, the average monthly number of women was estimated by considering the number of service users in the past six months, then study participants were selected by using a systematic random sampling technique. Before data collection, an eligibility criterion was set for all WLHIV presented to the ART clinic for their follow-up visit. After doing so, for those who fulfill the eligibility criteria, a sequential number was assigned according to their arrival order. Every three (K) of the study participants were selected after determining the first participant of the day. This procedure was repeated every

day until the required sample size was obtained. Multiple enrollments of the same participant were avoided by posting a striker on their medical record.

Inclusion/Exclusion Criteria

All randomly selected WLHIV who were receiving ART during the study period were the study population. Women aged 15 and above were included. Whereas, women who were seriously ill, unconscious at the time of the study, women with a prior total hysterectomy, and women who have a history of CC were excluded from the study.

Data Collection

A total of four data collectors and two supervisors were recruited with qualifications of BSc Nurses. Data were collected by the interviewer-administered structured questionnaire which was adapted from different literature (Erku et al., 2017; Nega et al., 2018; Viens et al., 2017). First, the questionnaire was prepared in the English language and was translated into Afaan Oromo and Amharic languages then translated back to the English language to keep the consistency of the tool by a language expert. The questionnaire contains information about socio-demographics, knowledge, and attitude toward CC screening, behavioral factors, and obstetrical and gynecological factors.

Data quality was thoroughly ensured from tool development to outcome analysis. The training was given to the data collectors and supervisors on sampling procedures, techniques of interview, and the data collection process by the principal investigator (PI) for two days, and any doubt in the questionnaire was clarified.

The questionnaire was also pretested in 5% of the sample size in Asella Referral and Teaching Hospital one week before the actual data collection to determine its appropriateness in the local context. The finding of the pretest was incorporated to modify and clarify the collection tool before actual data collection.

During data collection, completeness and logical consistency checks were made in the setting with close day-to-day supervision to ensure the appropriateness of the data collection procedure. The PI performed data coding, entry, and cleaning and after data collection, the supervisor and the PI together recheck the completeness and consistency of the questionnaire where a non-overlapping numerical code was assigned for each question.

Statistical Analysis

After data completeness was checked manually, it was entered into Epi Info version 7 and exported to SPSS Version 25 for further analysis. For continuous variables, the Shapiro-Wilk test was employed to determine normality. The test results were 0.07 and 0.08, suggesting that the variables had a normal distribution at a p-value >.05. Descriptive statistical analysis was conducted using frequency, percentage, mean, and standard deviation (SD). To identify factors associated with CC screening service utilization, both bi-variable and multi-variable binary logistic regression analysis was done and the variables in bi-variable analysis with p-values <.25 was fitted to the final multivariable logistic regression to adjust for potential confounders and to identify the determinants of CC screening service utilization. Hosmer and Lemeshow's goodness-of-fit test was employed to check the model fitness considering good fit at p-value ≥.05. To check whether the exposure variables are correlated, multicollinearity was checked based on the value of variance inflation factor (VIF) of greater than 10. In this study, the mean VIF was 1.6 indicating that there was no collinearity. In the final model, variables with p-value <.05 were considered statistically significant and an AOR of 95% CI was used to determine the strength of the association. Finally, the results were interpreted and displayed using texts, tables, and figures.

Results

Socio-demographic Characteristics of Participants

A total of 304 women living with HIV participated in this study making a response rate of 100%. Of the total respondents, 134 (44%) were in the age range of 30–39 years with a mean age of 36 (±5.7) years. Regarding their residence, 217 (71.4%) of respondents were urban dwellers. Among the total, 127 (41.8%) of the subjects were orthodox in religion and had attended elementary education 161(53%). Of them, 211 (69.4%) started sex at the age of ≥18 years (Table 1).

Research Question Results

Magnitude of utilization of CC screening service. The utilization of CC screening service among WLHIV receiving ART at AHMC was 82 (26.9%) with (95%CI: 22.0, 32.6) (Figure 1).

Reproductive health-related characteristics. Ninety-three (30.6%) women engaged in sexual intercourse for the first time before the age of 18 years. 273 (89.8%) gave birth at least once whereas, 232 (76.3%) women had the habit of using oral contraceptive pills. Seventy-nine (26%) of study subjects had a history of multiple sexual partners during the last 3 years. Fourteen (4.6%) study subjects had CC history in their family and 7(2.3%), and 122(40%) participants had cigarette smoking and STI history, respectively (Table 2).

Factors associated with utilization of CC screening service among women living with HIV. In bi-variable logistic regression analysis variables like residence, occupation status, monthly income, family history of CC, history of smoking, awareness about CC, history of STI, ever heard about CC, and ever heard about CC

Table 1. Socio-demographic Characteristics of Women Living With HIV Receiving ART at AHMC, Ethiopia, 2022 ($n = 304$).

Variables	Number (*N*)	Frequency	Percent (%)
Age	<30	99	32.6
	30–39	134	44.0
	>40	71	23.4
Residence	Rural	87	28.6
	Urban	217	71.4
Occupation	Farmer	16	5.3
	Housewife	128	42.0
	Government employee	85	28.0
	Merchant	58	19.1
	Other*	17	5.6
Religion	Muslim	96	31.5
	Orthodox	127	41.8
	Protestant	65	21.4
	Other**	16	5.3
	Unable to read and write	29	9.5
Educational level	Elementary	161	53.0
	Secondary school or above	114	37.5
Marital status	Married	194	63.8
	Single	55	18.1
	Divorced	19	6.3
	Widowed	36	11.8
Income	<500	49	16.1
	500–1000	112	36.8
	>1000	143	47.1

Note. Others*daily laborer, student: Others** were Waaqeffanna.

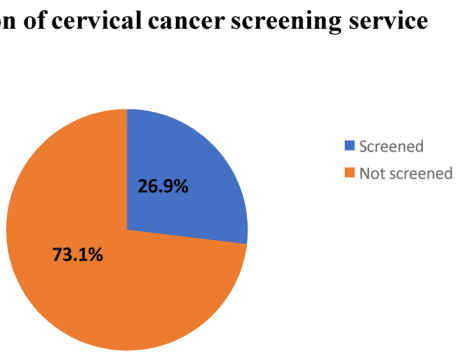


Figure 1. Cervical cancer screening service utilization among women living with HIV receiving ART at AHMC, Ethiopia, 2022.

screening had a *p*-value of <.25 and selected as candidate variables for multivariable logistic regression analysis.

In multivariable binary logistic regression analysis, occupation status, family history of CC, awareness about CC screening, history of STI, and ever heard about CC persisted to be statistically significant variables associated with CC screening service utilization at a *p*-value of <.05.

Table 2. Reproductive Health Characteristics of Women Living With HIV Receiving ART at AHMC, Ethiopia, 2022 ($n = 304$).

Variables	Number (*N*)	Frequency	Percent (%)
Age at first sex	<18	93	30.6
	≥18	211	69.4
Ever given birth	Yes	273	89.8
	No	31	10.2
Multiple sexual partners	Yes	79	26
	No	225	74
Ever had a history of STI	Yes	122	40
	No	182	60
Ever used a combined contraceptive	Yes	232	76.3
	No	72	23.7
Family history of cervical cancer	Yes	14	4.6
	No	290	95.4
Ever had a history of smoking	Yes	7	2.3
	No	297	97.7

Hence, the odds of CC screening service utilization were 8.09 times higher among women who are government employees than their counterparts [AOR: 8.09, 95% CI: (1.57, 41.19)]. The odds of CC screening utilization were 3.4 times higher among women who had a family history of CC than those who did not have a family history of CC [AOR:3.4, 95% CI:(1.02, 11.98)].

The odds of CC screening service utilization were 3.75 higher among women who had awareness about CC screening service utilization than those who had no awareness about the screening service utilization [AOR: 3.75, 95% CI: (2.11, 14.7)]. Compared to those who do not have a history of STI, women with a history of STI had a 3.14 times higher chance of CC screening service utilization [AOR: 3.14, 95% CI: (1.95, 10.2)]. The odds of CC screening service utilization were two times more likely among women who heard about CC than those who did not hear about CC screening [AOR: 2.6, 95% CI: (1.05, 6.41)] (Table 3).

Discussion

This study was conducted to assess the magnitude of CC screening service utilization and associated factors among women living with HIV receiving antiretroviral therapy at Adama Hospital and Medical College.

The overall magnitude of CC screening service utilization among women living with HIV was found to be 26.9% (95% CI: 22.0, 32.6). The result reported in this study is comparable with the finding from the studies done in Tanzania 22.6% (Lyimo & Beran, 2012), Kenya 27.5% (Lukorito et al., 2017), Hadiya zone, Hosanna 24.2% (Aweke et al., 2017), Mekele 29.8% (Bayu et al., 2016), and Bishoftu town, Ethiopia (25%)

Table 3. Bivariate and Multivariate Analysis for Factors Associated With Cervical Cancer Screening Service Utilization Among Women Living With HIV Receiving ART at AHMC, Ethiopia, 2022.

	Cervical screening utilization			
Variables	Yes%	No%	Crude OR (95% CI)	Adjusted OR (95% CI)
Residence				
Rural	31(35.2)	57 (64.8)	1.00	1.00
Urban	51 (23.6)	165 (76.4)	1.7 (1.02, 3.015) *	0.61 (0.32, 1.17)
Occupation				
Farmer	4 (25)	12 (75)	1.00	1.00
Housewife	26 (21.3)	96 (78.7)	5.4 (1.19, 24.81) *	5.3 (1.0, 26.3)
Government employee	29 (34.1)	56 (65.9)	25.9 (1.27, 27.9) *	8.09 (1.5, 41.19) **
Merchant	21 (36.2)	37 (63.8)	3.5 (0.55, 22.02)	2.4 (0.33, 18.56)
Others***	2 (8.7)	21 (91.3)	2.84 (0.62, 12.92)	4.5 (0.89, 23.1)
Income				
<500	7 (14.3)	42 (85.7)	1.00	1.00
500–1000	35 (31.3)	77 (68.7)	2.33 (0.98, 5.61)	1.47 (0.53, 4.06)
>1000	40 (27.9)	103 (72.1)	2.7 (1.11, 6.67) *	2.09 (0.76, 5.74)
Family history of cervical cancer				
Yes	9 (64.3)	5 (35.7)	5.3 (1.7, 16.48) *	3.4 (1.02, 11.9) **
No	73 (25.2)	217 (74.8)	1.00	1.00
Ever had a history of smoking				
Yes	5 (71.4)	2 (28.6)	7.1 (1.35, 37.57) *	4.5 (0.76, 17.2)
No	77 (25.9)	220 (74.1)	1.00	1.00
Awareness about cervical cancer and screening				
Yes	44 (40.4)	65 (59.6)	2.7 (1.6, 4.71) *	3.7 (2.11, 14.7) **
No	38 (19.5)	157 (80.5)	1.00	1.00
Ever had a history of STI				
Yes	57 (46.7)	65 (53.3)	3.1 (1.17, 8.09) *	3.1 (1.95, 10.2) **
No	25 (20.5)	157 (79.5)	1.00	1.00
Ever heard about cervical cancer				
Yes	70 (37.1)	119 (62.9)	5.0 (2.59, 9.83) *	2.6 (1.05, 6.41) **
No	12 (10.4)	103 (89.6)	1.00	1.00
Ever heard about cervical cancer screening				
Yes	51 (45.1)	62 (54.9)	4.2 (2.48, 7.24) *	2.0 (1.0, 5.61)
No	31 (16.2)	160 (83.8)	1.00	1.00

Note. *Significant at *p*-value < .25 in unadjusted logistic regression analysis, **Significant at $p < .05$ in adjusted logistic regression analysis.
Others***daily laborers, student.

(Solomon et al., 2019), but higher than the studies conducted in Morocco (9%) (Belglaiaa et al., 2018), Gondar (10%) (Nega et al., 2018), Southern Tigray (8%) (Gebrekirstos et al., 2022), and Addis Ababa (11.5%) (Shiferaw et al., 2018). On the other hand, our finding is lower than that of studies done in England, Catalonia, and Nairobi Kenya which reported 85.7%, 50.6%, and 46%, respectively (Njuguna et al., 2017; Ogunwale et al., 2016; Stuardo et al., 2013). The possible reason for this variation could be the lack of local health extension programs that help the community to be aware of the availability of the service. Moreover, discrepancies in the findings could be explained by differences in the age distributions, limited services provided by health facilities in the study area, lack of awareness of women about the availability of functional service that provides CC screening, and lack of formal policies and programs that makes the screening mandatory for HIV positive women in the study area.

According to the finding of this study, women who were employed in government organizations were 8.09 times more likely to uptake CC screening services. This report is in agreement with the finding of studies conducted in Latin America, Ghana, and Gomma district, South West Ethiopia (Gizaw et al., 2022; Soneji & Fukui, 2013; Tawiah et al., 2022). This finding is widely linked to women's financial constraints to screening. Interestingly, even with the availability of free screening services, this association persists in our study participants, implying that anticipated costs, autonomy, and overall health-seeking behavior may have had an impact.

Respondents who had a history of CC in the family were 3.4 times more likely to have CC screening services than their counterparts. This finding was similar to the study done in the Gurage zone, Southern Ethiopia (Endalew et al., 2020). This might be due to family members who have had CC exposure can easily distribute any clinical symptoms and adverse

effects related information to their family, which tends to increase their CC screening utilization.

In this study, women who had awareness about CC screening were about 3.7 times more likely to utilize CC screening services than those who had no awareness. This finding is supported by studies conducted in Tanzania, Nairobi, Kenya, and Addis Ababa, Ethiopia (Belete et al., 2015; Emru et al., 2021; Lyimo & Beran, 2012; Ogunwale et al., 2016). The possible explanation is that as they gain more awareness about the screening services given in the health facilities including, how screening will be done, side effects, time the procedure takes, they will go for the screening service.

This study also revealed that women with a history of STI were 3.14 times more likely to utilize CC screening services than those who do not have a history of STI. Similar findings were reported from the studies done in Florida (Seay et al., 2015), and various studies in different parts of Ethiopia (Bayu et al., 2016; Kasim et al., 2020; Mekuria et al., 2021). This association might be explained by the fact that sexually transmitted diseases like HIV, HPV, and others can cause symptoms that increase the likelihood that a person will seek medical attention and undergo a gynecological examination as well as learn about CC and screening, both of which increase the likelihood that someone will do so.

The odds of CC screening service utilization were 2.6 times more likely among women who heard about CC than those who did not hear about CC. This finding is consistent with a study done in Felege Hiwot Referral Hospital, Amhara, North West Ethiopia (Abebe et al., 2021). The finding is plausible because participants who heard that CC is a killer, communicable, and preventable disease will become concerned, fearful, and want to utilize CC screening.

Strengths and Limitations of the Study

As a major strength, this study tried to address a neglected but important public health issue, especially in the study area, by collecting data from primary sources. Given that the study used a cross-sectional study design, it will be difficult to establish a temporal relationship between the independent and the outcome variable. Moreover, recall and social desirability biases might have been introduced.

Implications for Practice and Research

Health education programs and other multidisciplinary approaches should be used to increase CC screening service utilization among women living with HIV. In the future, we suggest conducting a qualitative study to examine comprehensive opinions and attitudes concerning CC screening utilization. In addition, we recommend an interventional study to impart awareness about CC and evaluate its utilization at a defined time after that intervention.

Conclusion

The magnitude of CC screening service utilization was low. It was associated with occupation status, family history of CC, history of smoking, awareness about CC screening, history of STI, and ever heard about CC screening. Thus, health education programs and other multidisciplinary approaches should be used to increase CC screening utilization among women living with HIV.

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Author Contributions

KZ, WY, and SM participated in the conception, and designing of the study, and analyzed and interpreted the data. SM, MY, and MA participated in the designing of the study, analysis, write-up, and drafting of the manuscripts. SM and MY critically reviewed and drafted the manuscript. All authors read and gave final approval of the version to be published; have agreed on the journal to which the article has been submitted, and agree to be accountable for all aspects of the work.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethics Approval and Consent to Participate

Ethical clearance was obtained from the Institutional Review Board (IRB) of Adama General Hospital and Medical College with an ethical number of AGHMC IRB /092/2022. Then, an official permission letter was provided to the Adama town health office and Adama hospital medical college before data collection. During the data collection time, the objective and advantages of the study were thoroughly explained to the participants, and informed written consent was obtained to ensure their choice of participation or refusal. Further, for respondents under the age of 18, written informed assent from them and written informed consent from their parents/guardians were acquired before data collection. All participants were instructed not to write their names or any other personal identifier on the forms. Confidentiality was preserved throughout the research process by using anonymity and privacy protections to protect respondents' rights.

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ORCID iDs

Mihiret Shawel Getahun https://orcid.org/0000-0003-2758-2760
Yohannes Mekuria Negussie https://orcid.org/0000-0002-1332-670X

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