The role of sociocultural contexts in forming adult HIV-patients’ behavior towards the prevention of metabolic syndrome: A descriptive phenomenological study

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Abstract

Background: The human immunodeficiency virus-associated metabolic syndrome (MS) in Sub-Saharan Africa (SSA) is becoming an important concern for its additional disease burdens imposed on society, intensified with limited knowledge of how to prevent and recognize the sociocultural contexts' role in dictating behavior towards the modifiable risks. The aim of the study identify the role of sociocultural contexts in shaping individual PLWHs behavior focused on how knowledge, attitudes, and practices (KAP) influence the feeding habits, physical activity and harmful substance use habits among adult PLWHs, in the Gedeo zone, South Ethiopia.

Methods: A deductive descriptive phenomenological study, complemented with a thematic content analysis approaches, enhanced with the focus group discussion (FGDs) and an in-depth interview method were employed; starting from February 1st to 30th of March 2018. Adult PLWHs and their corresponding care providers were purposefully chosen and involved in the interview. Finally, Atlas. ti (V.7.5.7) and SPSS (V.20) software were used to handle and analyze all text and survey data respectively iteratively; finally result is reported using the consolidated criteria for reporting qualitative research (COREQ) checklist.

Result: A total of six (n=4 FGDs and n=2 in-depth) interviews, arranged in a total number (N=32) male and female PLWHS, whose mean age of 36.96 (+ 8.94) years and duration of treatment 5.19 (SD 3.16) years were involved. The coded response dictated the knowledge and practices regarding the dietary habits, intentional physical activities and other lifestyle behavior into the inadequate group; as well as the attitude into an unfavorable direction.

Conclusion: The absence of adequate knowledge about MS and its risk prevention mechanisms leads to the unfavorable attitude and inadequate practices. This implicates the significance of the adoption of the healthy living practices associated awareness creation program targeted the PLWHs to impact their behavior to enable better control of NCDs and its consequences.

Background

Works of literature notified that an extraordinary global effort to increase access to HIV treatment has put 46% of people living with HIV’s (PLWHs) on antiretroviral therapy (ART) worldwide (1, 7).
Subsequently, the PLWHs have shown better prognosis, decreased HIV transmission and improved survival (7, 8).

Nevertheless, the increasing survival, in addition to HIV associated disorders, non-AIDS comorbidities are important factors that negatively affect the mortality rates of PLWHs(8-10), and metabolic syndrome (MS) is one of those comorbidities. It is usually defined as a complex of the diseases comprises abdominal fat, increased blood pressure, dyslipidemia or fat redistribution and or elevated blood sugar (3, 11–19).

Incontestably, adult with MS will have a twofold as likely to die from and three times as likely to have acquired cardiovascular disease(CVDs) (i.e. 17.7 million cause of deaths, or 45% of all NCD deaths contributor) (20) and a five-fold greater risk of developing diabetes mellitus (DM)(i.e 1.6 million causes of mortality) (21, 22), compared with people without the syndrome, and they are among the four most common and the leading causes of Non-Communicable Diseases (NCDs) related deaths(3, 13).

Implicated the significance of the shift of paradigm to prevent the incidence of NCDs at least in these vulnerable segments of the populations through promoting the PLWHs behavior towards the lifestyle factors than treating them with additional drugs. This is because the premature deaths from NCDs are largely preventable, mainly driven by those four big lifestyle factors comprises physical inactivity, unhealthy diets, tobacco use and the harmful use of alcohol (20, 23, 24). However, promoting of one’s health behavior towards those factors requires a change in behavior by acting upon the contexts surrounding it; since, they are interrelated and rooted in cultural, political, social, economic and environmental contexts, which are often outside of individual control(25). One contextual factor that most scholars agree with, is central to understanding health behavior is culture (26, 27).

Culture in this context refers to shared norms, values, and codes that jointly shape a group’s beliefs, attitudes, and behavior through their interaction in and with their surroundings (26, 28). Through culture, we learn to appreciate communities’ assets and liabilities (23, 26).

In this respect, the PEN–3 cultural model provides valuable guidelines for the cultural sensitivity on individual’s health behavior by identifying and organizing a community’s cultural components as an
input for the planning of an effective strategy to address minority health issues (26, 29–32) (Fig 1.tif). It has three main domains, each constructed with three intrinsically linked sub-domains, which forms, acronyms of “PEN” (Fig 1.tif). The cultural identity domain is the one used as a tool that directs the origins of health behavior (i.e. sources of health knowledge); also used as an important intervention entry point at various levels of the person extended family, and neighborhood. The relationships and expectations domain has three sub-domains of perception, enabler and nurtures that the construction and interpretation of behavior are usually based on the interaction with the three sub-domains The cultural empowerment domain has three constructs: the positive, existential and negative tool, which is used to identify the influence of culture on health, behavioral decision, through exploration of the positive, existential and negative ones (26, 32–35) (Fig 1.tif).

Therefore, this study aimed at assessing the impact of sociocultural contexts on framing behavior towards lifestyle risk factors using this model as a theoretical basis among PLWHs. a sociocultural contexts referred as any cultural, personal, familial, social, environmental, structural, economic, historical, political, religious, and other factors that either promotes or hinders individual behaviors (i.e. knowledge, attitude and practices (KAP)) towards the lifestyle risk factors.

The core idea was based on the concepts of Airhihenbuwa (1989) that the sociocultural setting in which one’s life is guided to a very large amount what a person is known, the attitudes s/he holds, and the practices s/he develops (29). Thus, while an alignment of knowledge and practices were determined as adequate and or inadequate, attitude was affirmed as favorable and or unfavorable, through use of the PLWHs views. In responding these, putting the cultural identity domain of PEN-3 model was crucial to identify behavior associated with the study theme. The growth of individual customs connected to those modifiable risk factors that nurture, or enable these, and their clear consequence of health (positive, negative, or neither of the two) were found responses in all domains of the model (Fig 2.tif). Knowing this is the 1st phase in the right way to prevent MS occurrence at individual and public health levels since the contrasting thoughts and understandings from participants open newsflash means of thoughtful and identifying what is known and unknown.

Methods
Research team and reflexivity

Personal Characteristics: One research team and two task teams were established in Dilla university referral hospital (DURH) and Wonago health center’s (WHC), were deployed after taking of a two days training. The first team was formed with the combination of the chief author and other two public health professionals all having 2nd Degrees and sound experiences in research and the profession. While the chief author’s particular role was on moderating the whole discussion, the other members took part on note-taking, organizing necessary events and of audiovisual data documentation, field notes expansion, and formation of a research team reflection summary note. The 2nd two teams’ principal role was too engaged in the subject recruitment process. They were formed from the combination of 3 health workers and two (male and female) adherence counselors served in the ART clinics of the study sites.

Relationship with participants: before the commencement of the study, a sort of time arrangement was made to introduce and meanwhile to spend some time with the participants and research team during the study recruitment process.

Study design

The study used a deductive descriptive phenomenological qualitative approach using thematic analysis methods.

Source and study participants All confirmed adult (≥ 18 years old) HIV positive subjects, registered in the above institutions’ ART clinics were considered as a source population. The volunteers’ PLWHs with the diverse socio-demographic characteristics stratified by their sex/gender, along with their corresponding health care providers were used as a study population. None of the participants refused to participate in the study.

Sample size determination: was made purposefully planned to be conducted about 6-Focus group discussions (FGDs), arranged up to 6–8 individuals PLWHs per discussions, and about 3 in-depth interview with three health workers. However, a total of (n = 32) PLWHs, and (n = 3) health care providers were involved. Besides, the unconditional in-depth interviews was also made with male and female PLWHs who arrived late.
**Sampling method:** A purposive sampling technique was employed to recruit the study unit.

**Recruitment procedures:** The PLWHs was 1st informed about the study’s aim before they took their routine care orally with the assistance of those adherence counselors in the task teams. Soon after the team appreciated the subjects’ willingness, they immediately linked with the health workers to map out of them, and enriched with more information about the study. Subsequently, securing of written consent from each volunteer, screening of them proceed with personal and anthropocentric data collection was quickly initiated. Lastly, they immediately communicated with the research team and then appointed to come back after a week for the discussion. The time schedules of the participant recruitment and data collection procedures were undergone sequentially for each health facilities and the male and female groups.

**Study setting and period**

This study was conducted in Gedeo zone, which is located in the Southern Nations Peoples (SNNP) regional, state at about 360km in a south direction from Addis Ababa, the capital city of Ethiopia, and 86 km in a Southeast direction from the capital city of the SNNPR, Hawassa town. In the zone, there are 141 health posts, 10 health centers, and 1 referral and teaching hospital and 3 primary hospitals. Overall, during the study period, 3,225 PLWHs on ART were registered and actively followed in the chronic HIV care clinics of the above public health facilities. Of all health institutions, this study was conducted in the Dilla University Referral Hospital (DURH) and Wonago Health Centers (WHC), considered for their convenience of distance and access to transportation, beginning from February 1st to 30th of March 2018.

**Data collection procedures**

Standardized semi-structured, open-ended FGDs-guide adapted from previous studies and adapted into the study contexts, first written in English language translated and back translated into Amharic language was employed (26, 33, 34). Its wording was easy, clears none ambiguous, short and allows open sharing of idea and sound conversation with probing questions. The guide comprises all the fundamental components: an introduction section fully explains the issues about the purpose of the study, consent, confidentiality, and the reimbursement scheme that gradually leads to the main
question. The main questions were structured by the conceptual framework of knowledge, attitude and practice (KAP) using the three domains of the PEN-3 cultural model constructs as a theoretical basis; where the questions are sequenced in the logical sense holding a neutral ice-breaker and the transition questions. The remaining main questions were structured in a similar fashion. Indeed, one and half hour time was planned for the discussion before; however, 2 hour was allotted after pre-testing of the guiding tool. Inline, contextually similar but smaller in the content-wise in-depth interview guide adapted on similarly themed questions was also employed to guide the interview arranged among health workers.

*Logistic preparation and Interview procedures:* All the necessary logistic arrangements were made, before commencing the study. Then, the audio recording of all interviews was made by using a Huawei P7 smartphone digital sound recorder and was saved to a micro SD card in the MP3 format to the researcher’s computer. Also, the video and pictures were taken and used to recall the events using a 20.1 MEGAPIXELS Sony digital camera and the files were stored on SD card, and then backed up to the same ways. Apart from the above documentation, field note was besides taken on verbal and non-verbal cues partly using short way of nonfiction using a Sinar line notepad and Lexi-pen.

*Data handling and analysis procedure*

The entire text document, audio, video recordings and pictures and survey data were stored as a primary data source for analysis. The data analysis procedure was iterative comprising appraisals and discussions at various stages of data collection; continuous comparison of new data with previous data and performing the correct reforms on the coding and categories to attain the emerging words and phrase. Although final step of the analytic procedures was performed only by GirmaTenkolu (GT), however Sadat Mohamed(SM) was besides involved. For that to happen, they met several times and discussed to the extent to which categories reflected in the data and reached consensus on the segmentation, a summary text data formation, and partial determination of coding and code category. In the coding process, each data item has been given equal attention and words and phrases have been thoroughly inclusive and comprehensive. All relevant extracts for each code have been collated and checked against each other and back to the original data set to maintain it to be
internally coherent, consistent, and distinctive. Overall, enough time has been allocated to complete all phases of the analysis adequately without rushing a phase or giving it a once-over-lightly. By the individual and the technique employed, the data analysis procedure was accomplished in two phases, two sections and seven steps.

The first phase of data analysis begun at each data collection time, with the partial involvement of the respondents, instantly after the end of each discussion for their verification and all members of the research team, to familiarize, segment, code and collate the codes of a text document. It was a two-step activity of data capturing and transcription, as well as transformation and translation, accomplished independently by GT and SM by employing the pre-established codebook (S1_Table 1 Code-Book. supplementary).

The 2nd phase of the analysis ended with two sections, lasted from uploading all the primary data into the computer software up to the synthesis and formulation of the themes. The uploading of data was accomplished with Atlas. ti (V.7.5.7) and SPSS (V.20) software to handle all text and survey data, respectively. Atlas.ti was used to upload all the primary data sources and storing them as a primary documents family (PD) into a large electronic envelop called as “Hermeneutic Unit”. The synthesis and theme formulation section of the analysis was accomplished through employing of an open coding system (thematic analysis)-characterized with a step by step activates categorized in to five steps. In the first step, re-familiarization and an overall understanding of the contexts were made through reading and re-coding, noting down initial ideas of the data several times back and forth. In the second step re-dividing the text document into meaning units through employing the words, phrases, paraphrases, and sentences as a coding unit, condensed and labeled with the conceptual framework of KAP emerged inductively across the entire data set. In the third step, the codes were aggregated into categories based on similarities and differences and searching for codes through collating codes into potential words and phrases, gathering of all data relevant to each potential words and phrases were made. In the fourth step, the codes, and code categories were reviewed and a thematic ‘map’ of the analysis was generated. Later, the themes that examine the connection of KAP with MS risk factors, along with the three sub-domains of the model were framed as an
expression of the latent meaning of a text. In the fifth steps, the production of the reports with the selection of vivid and compelling extract examples and organization of it using the consolidated criteria for reporting qualitative research (COREQ) checklist (36) were made, and then finally sent to the study participants for verification. In addition, the text data from health workers and the research team debriefing (RTR) were besides used as a source of triangulation to establish the trustworthiness of the findings from the participant’s interview to the resolution of discrepancies in the attendee accounts.

Results
- Descriptive report

The socio-demographic characteristics of the respondents: A total number of six (4 FGDs and 2 in-depth) interviews, arranged among (N = 32; n = 18 at DURH and n = 14 at WHC) male and female PLWHs were involved in the study. The mean age these respondents was 36.96 (sd8. 94), with more than half, 68.8 % (22) of them were found within the age range of (35–44) years. Of whom, a larger proportion, 40.6 (13) of them were on ART for (1–3) years, with the mean duration of 5.19 (SD 3.16) years (S2_Table 2.Sociodemographic_data. supplementary).

The characteristics of health workers: In the in-depth interview section, there were n = 3(a female and 2 male) healthcare workers were involved. Their mean work experiences was 4.33 (sd = 0. 58) years, and mean length of service in the current unit was 34.67 (sd = 23.1) months.

Qualitative report
The knowledge associated health behaviour
Person
Personal experience of serious disease tragedies as a source of health education
The entire data set assessment reveals a number of ideas related to various disease conditions.

Definitely, this section will use quotations from the participants’ replies to provide a general overview of the personal knowledge acquisition. With this regard, some of the subjects stated as follows:

“.... I had no idea about this disease before... Once upon a time, I had fallen into sick for the reason I don’t know.... So, I went to the health center nearby... Then, I was informed that I have the virus in me as a result of the test....” (M8_FGD2)

“... My experience to see people died of the sudden situation made me know about the
dangerousness of these diseases...” (W7_FGD1)

The above extracts divulge a number of disease events encountered entailing ‘Allergy’ (which is called ‘Shifitah’ in Amharic), ‘Diarrheal disease,’ ‘unknown unpleasant disease situation’, as factors that explain the personal sources of health information. This in turn dictates the significance of use of the victim or attacked individuals as health educators to give information for the PLWHs, in order them to bring positive behavioral change towards the contexts under investigation. One of the overarching issues emerged in the discussion was about ‘the personal knowledge status towards the phenomenon under investigation. Few of the under selected interviewees reflected this concern in their responses as:

“... So far, I was not sick ... but I know people who have taken the tablet for many years.. I know people who use the tablet buying it before it was supplied by hospital level....but I have never seen them facing any health problem... As to me, I don’t believe it may cause any problem... As you guys say about metabolic problems, such as diabetics and the likes, I have heard that people who are not infected with the virus face” (W7_FGD1)

“... After I began taking the drug, I have got a severe headache: burning like a fire.... I feel like a wound in my head... it makes me as an intoxicated person...concerning metabolic problems, I know nothing...”(W3_FGD3)

Given that participants were systematically requested to enumerate the long-term effects of aging with HIV, and in their response, they failed to indicate the name of the disease or to identify what metabolic syndrome. Even after they got investigated by calling the name of the syndrome, their response firmly shown they have any know how and perceived as it hardly had any connection with their health conditions. In its place, their replies were shown other kind of health complications that are not related to the concern of the study. All in all, this dictates the inadequate knowledge state of the participants’ about chronic diseases and its association with their current health problem.

Extended Family

The family role played as a source of health education

In this regard, a list of catch phrases was emerging from the entire data set to represent the family
member’s role played for the health teaching of the PLWHs towards the study concept. With this regard, this section has used some of the extracts from the respondent replies, as an example.

“... I came to know myself because of my husband... My husband had a blood test for HIV during a certain campaign of HIV blood test in tent age... in his return home, he told me that he was infected....but I couldn’t believe by then... Afterward, I decided to have a blood test; saying God preserves to me...the result of the test showed that I was infected... Then, I started taking the drug...”(W5_FGD3)

It reveals that the respondent began to be concerned for their health, spontaneously from the blood HIV tests that they had undergone, subsequent with the family member’s, primarily of their spouse (wife or husband) acquaintance to the virus. The result further pinpointed issues linked with the incident of chronic disease tragedies. With this respect, the data extracted below can explain the case as:

“.... I, personally, came to know about diabetic’s disease pretty well because of my friend.... She was infected by this disease.... She had been told that she was a diabetic, and she ought to have taken the drug properly...She quitted taking the drug and died; failing to act in accordance with the health practitioner’s advice...”(W3_FGD1);

“... I have seen it on my mother... My mother is a diabetic patient.... If she gets a minor wound, the wound never gets cured soon....She can’t eat what she wants...”(W5_FGD3)

As it is indicated in the upper extracted replies from the participants’, the exposure from disease tragedies of ‘hypertension and diabetics,’ encountered by one of the family members, primarily by mothers and intimate friends, was a primary source of health information. Overall, the finding dictates, the personal tragedies predominantly happened to the spouses (wife or husband), and mothers and friends could be a source of health information. Furthermore, in relation to the above concern, the quotation below revealed that

“... Concerning keeping health and preventing disease, we, among our families, discuss and teach each other... In fact, we most often focus on issues of HIV.... My family does not have any prior knowledge about the things we are discussing.... Had they had awareness about such things, my
children wouldn’t have hesitated to tell all members of the family…”(M1_FGD4)

As the above reply divulges ‘the advice given by the family member’ and ‘the discussion arranged in the family unit’ was also identified factors so as to represent as a primary source of any health knowledge, mainly related with their health problem (i.e. HIV). Meanwhile, the study result illustrated the individuals who were influential to disseminate information within the family unit. Regardless of the means, moments and the contexts, mothers, the spouses (husband or wife) the children’s, sisters and brothers were found as an apparent role player of personal health education in the family unit.

Neighborhood

The formal structures as a source of health information

In relation with the formal organizational structures, a list of phrases associated with the government structures as well as professionals were emerged from the entire data sets as factor representing the sources of personal health knowledge acquisition. Of the government organizational structures, though few of the data extracted failed to indicate the name of the particular government structures vividly; however the responses were effective on designating the various mass-media sources, particularly radio and television, internet access and brochures as primary sources of health information. With this regard, the data extract give affirmation, as follows:

“… I get more health information from other media, television and radio…. Though it is not about such problems, as you heard in recent weeks, we heard health-related information from these media…. And, I sometimes get information from newspapers…“(W7_FGD1).

On the other hand, there was an apparent name of ‘the government’ that was directly indicated as a prime source of health education. With this regard, one subjects’ quotation as:

“… Concerning our health problems… The government provides us with a supply of the tablet, but it doesn’t provide us with any other support… It used to give a nutrition item called “Pamphlet” for only those who have a food shortage, but it’s quitted nowadays…”(W5_FGD3)

As is revealed in the extracted above data, although the word ‘government’ did not directly refer any entities, the contexts dictate that it was likely employed to represent the health care organizations role-played to deliver education on the theme under study. In relation to this, there were also a
phrase appeared to represent the health care organizational structure associated factor. In this respect, the data extracted from the participants’ response below explains more.

“... Whereas, I got full support from health institutions...On top of that, health institutions are delivering information on various types of health problems in the outpatient department before issuing cards“\(W1\_FGD1\)

Besides, in relation to the upper indicated organizational structures, the data sets likewise reveals expressions linked with the health professions as a similar source of personal knowledge of that regards. With this respect, one of the respondents’ said as.

“... In addition, we have provided instruction about HIV by health extension workers in each ‘Kebele’... In fact, we have never been given information about any other health problems ...

\(M1\_FGD4\)"

As is pinpointed in the upper mentioned extract, the health extension workers (who worked at the grass root level) were the ones that are identified to represent the type of health professionals and declared as a varicose role player of personal knowledge acquisition. Apart from the health extension workers, there also appeared professionals name called as the doctors or health practitioners identified in the extracted data below as a parallel player of health information dissemination to them.

With this regard, the quotations below are taken as an example:

“.... The doctors advise us... As for feeding, they say to us; “Before you eat the food, whatever you cooked; be it cabbage or others, heat it.... Don’t eat uncooked food.”\(W2\_FGD1\)"

The informal structures as a source of health information

Of those informal systems ‘the social structure, was also the other subject emerged from the data set as a prime health information sources of the PLWHs about the theme of the study. Of those systems, the social call, which is known in Amharic and called in the local contexts as ‘Idir’ was originated as an identical player of the personal health knowledge source, as indicated below:

“... With regard to this, I dare to say that members of ‘Idir’ are organizing a discussion forum for health education; especially on HIV.... And, I’d like to recommend such a discussion forum should be sustainably organized.”\(W1\_FGD1\)"


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It was evidenced in the above quotation that the existences of such a social system created an opportunity for them to get together and discuss on various issues, at large and specifically of health matters, in particular amongst themselves. Furthermore, in association with the above themes, the study result also reveals issues associated with the religious organizational structures, typically ‘the churches’, that emerged as a primary source of health information dissemination according to the extracts of the interviewees, below:

“... The church also gives us a lesson to protect ourselves and not to transmit to others with negligent and not to commit sin... but they never give us other health-related lessons we only get this kind of lesson only from health institutions. We prepare a peer discussion for awareness...” (FP_Ind1);

“... Coming to religious institutions, ‘Aboye-church’ is doing its contribution by providing financial aid and awareness creation teachings about HIV; for example ...” (M8_FGD2)

While few of the data sets justified the role without stipulating the precise name of the churches, others were definitely revealed about the orthodox religion associated local churches such as: ‘Aboye’, ‘St. Mary’, and ‘St. John’ churches as comparable sources of health education. In short, the finding reveals the entire roles played by a for mentioned formal and informal structures located in the zone so far to educate the PLWHs; however all were not dare about the concept under investigation (S3_Table 3 respondents Suplimentary_Data). In this respect, partly identical concepts were likewise raised by the research team during the discussion, and in the data set formed via the interviews undergone with the health care providers (see S4_Table 4 researcher debriefing and health workers _Data).

Attitude associated health behavior
Perception

Belief and values system

The quotations below are from participants who have been given thought to the belief and value systems towards the phenomenon under investigation. With this regard, they said that:

“...if I am told that I have diseases... I will feel nothing....because if I can live with the big one HIV, how cannot I able to handle this?.....” (MP_Ind2)

As for mentioned data indicated that the disease (MS) is as a simple health problem, compared to HIV
that the participants’ didn’t feel anything if they would have been victim to it. This might show the state of knowledge that the PLWHs have about the syndrome and the worth of making decision directed towards the measures of healthy lifestyle practices. Inline, as the extracted response below further revealed.

“… The only solution I have is live by taking the medicine....(Smile like swearing...then....smile....now if I am told that I have diseases .... I might feel nothing beyond that...”(FP_Ind1)

The PLWHs perceived as living peacefully through use of the medication prescribed by the physicians’ as the only means that the victims intend to follow if in case they are victim to such type of health problem. This, in turn, dictates the value system of the PLWHs have about HIV infection and the recognition given for the curative health care than preventive care. On the contrary, as indicated in the example below.

“... They (chronic diseases) are serious health problems... It is so difficult, even to think... Because once you got these diseases, death awaits at the door of your house at any time.... It means that I have deserted my children as orphans...... What would more a catastrophe come upon you?”(W7_FGD3)

The diseases are deemed to be a big and a serious health threat that necessitates everyone’s attention. Though they replied in the way that it shows the urgency of the syndrome; however, the circumstance substantiates the beginning of the above thoughts not from the real recognition of the severity of the syndrome, rather put forth this justification due to the additional cost that the disease believed to account together with HIV infection and the fear of death potentially occur following the conception of extra doses. This, in turn, dictates the contextual understanding state of the PLWHs and their commitment to have a positive feeling of the development of attitude towards MS and prevention measures of its risks as well.

Enabler

Organizational role as enhancing enabler

In this regard, as the following quotations reveal:

“... As we know most often, there are many situations that the government endeavors with a great
initiation to create awareness creation on issues worth-noting among the community in any ways available; as well as to implement with the purpose of enabling...” (M8_FGD2)

As is illustrated in the extracted data, the organizational influencing role seems to be counted as the enhancing enabling factors for the growth of the current attitude established by the PLWHs towards lifestyle associated with MS risk reduction measures. Further, as is illustrated in the extracted data, they said as:

“... I dare to say that the presence of health extension workers here enabled us to have the know-how about health to some extent, though it’s not sufficient...” (M3_FGD2); “... I came to know the severity of these diseases as a result of the information I obtained from the health practitioners...” (W4_FGD3);

“... The doctors advise us... As for feeding, they say to us; “Before you eat the food whatever you cooked; be it cabbage or others, heat it... Don’t eat uncooked food.”...” (M4_FGD2)

Although the extracts above explains about the different type of health professionals’ such as the endeavors made by doctors and health extension workers employed in the health care organizations, but their expression indirectly reveals the health care organization’s enhancing influencing role played to address the contexts under investigation.

Living with HIV as a discouraging enabler

Besides, ‘living with HIV’ was the other catchphrase apparently seen in the data set that categorized under hindering enabling factors of the current attitude of a person holding towards the phenomenon under study. With this regard, one of the subjects said as:

“... In this regard, my opinion is a bit different....because as we are living with the virus, we focus on activities to be done in order to halt the virus; such as...continuously taking the tablets, and keeping ourselves.... Thus, we don’t take such problems into account...” (W3_FGD1)

In the response, she denoted that living with the virus as it mostly sensitizes them and forced them to focus on activities essential to halt the problems that they experienced due to the virus than any other health problems resolving actions. Moreover, there were also a number of little snippets extracted from the participants’ responses that supports the above concepts.

“HIV is so dreadful to me” (M2_FGD2), “Following this (HIV), you may be exposed to many and varied
problems; particularly, lack of money would inevitably challenge you” (M6_FGD2), “You will especially be troubled not to work your job properly” (M6_FGD4), and “I regard my living with the virus as a big hindrance” (M2_FGD2)

These illustrated that living with the virus potentially predisposes the victim to any form of difficulties by imposing pressure in their life.

**The socioeconomic contexts as a discouraging enabler**

Additionally, a number of factors related with the social and economic contexts were the other form of sections emerged from the entire data sets as a factor categorized as a discouraging enabler. As regards, the participants' replied as:

“... As is known, the population size is highly increased here...there is no ample farming land as compared to the population size in our Zone... Hence, our inability for producing other alternative food production to feed ourselves and our families; as well as our inability... In addition, the absence of food aid here is the foremost problem that hinders for us not to improve our feeding style...”(M2_FGD4)

“... I perceive our being dependent (needy),... illiterate,...daily laborers for winning our daily bread; as well as having meager income, as a hindrance...”(M3_FGD4)

As is indicated in the upper mentioned replies, an overgrowth of the size of the population causes the residents of study zone to suffer from scarce farming land that necessitates for the cultivation of agricultural food products, and this indirectly predisposes them to be economically deprived and dependent for winning their daily bread. This implicates, the existed economic crisis in the localities that they experienced subsequent with the upper mentioned reasons has a potential risk to hamper anyone’s ability to afford and fulfill their necessities of life, including the basic needs presuming to have healthy lifestyle associated attitude towards the modifiable risk factors of MS and NCDs, among those PLWHs. In line with this concern, the following little snippets “the absence of food aid” (M2_FGD4), “our inability for producing other alternative food production”, and “food crisis” (M2_FGD4), “the economic ranks being poor to afford our daily bread” (M3_FGD4), “the meager income earned” (W3_FGD3), “being unschooled” (M5_FGD4), and “unemployed” (W1_FGD1) to afford
to eat whatever we need daily” were also apparently identified sayings that represents the socioeconomic contexts that categorized as a discouraging enabler of the theme of the study. Further data under this theme is attached as a supplementary data (S3_Table 3 respondents_Suplimentary_Data).

The health extension workers restricted effort as a discouraging enabler

Correspondingly; in this context, as one of the participants’ quotation reveals as:

“... In my opinion...the presence of health extension workers here ...though it’s not sufficient...; however, what’s the big problem? ... These people most often teach us and give treatment on only issues of mother-childhood problems; as well as HIV and TB problems.... Though it is good in its own right, I can’t dare to say they have helped us since they didn’t do any support on issues of other health problems....”(M3_FGD2)

The above reflections indicates, the efforts made by the health extension workers were not undermined but their area of focus being restricted on another disease (i.e. other than NCDs) attributed as a hindering factor for the knowledge gained and attitude they hold regarding phenomenon under investigation. The terms ‘Health extension’ represent a kind of health profession, which is a unique in profession that exists only in Ethiopia. These health workers are like a community health workers who serve at the grass root levels of the community; mainly in the health post (i.e. the lowest health service delivery, organizational unit of the country), which is localized at ‘Kebele’ levels (i.e. the smallest government administrative unit of the country, Ethiopia).

Nurturer

The family members’ role as enhancing nurturer

In addition, the family support and family illness tragedies were the phrases apparently observed in the data sets as enhancing nurturing factors of the PLWHs towards positive behaviour. With regard to the supporting role that the family provided, the quotation below explains more.

“... I don’t underestimate my families: my spouse’s and my children’s support.... My families provide me support in many ways... They remind me if I forget my drug taking time; for example..... Above all, they sometimes help me to have the know-how on issues related to the virus as per their
knowledge…. I have told you that my families’: My spouse’s and my children’s support is high, haven’t I?…. as I often talk about my problem to them, my neighboring encourage me at least by saying: “Be of good cheer…..”(M1_FGD4)

As the extracted data revealed; though it was dared with HIV and AIDS; principally of about remembering the time to take ART drug and about disclosing their HIV-status to others, but the enhancing role-played by the spouse and children’s were reported to be exceptional. In the contrary to the above idea, the result pinpointed the absence of family support as a discouraging nurturer. In this respect, the following quotations taken from the interviewee can be cited as an example:

“… I merely say, my family didn’t provide me with any support….for that no one can be accountable, except me? You know why? It’s me who refused to inform them!… I intentionally did this… ”
(W6_FGD1)

By doing so, the subjects could not get any support, be it from their family members or from others. This pinpoints that their being unwilling to disclose their real health status, at least for relatives hindered them to be benefited to restore or maintain the situation. The trend exhibits that their lack of knowledge and poor attitude towards disclosing themselves has a negative effect on their health status. The trend, hence, needs to be altered to adjust their lifestyle practices for betterment. In this regards, additional information is attached as a supplementary data (S3_Table 3 respondents_Suplimentary_Data).

The social stigma and discrimination as a discouraging nurturer

As well, the data set also revealed subjects associated with social stigma and discrimination. With regard to such thing, the data extracts of the interviewee stipulated below divulges the saying as:

“… It is needless to talk about the community. (Gesticulating... What I have realized is that the community strongly detests using the cups we used... And, the community let alone supporting us; even after such all activities, they kept stigmatizing/discriminating us from any social interactions. (Expressing unintentional, deep sorrow on her face)... What really surprises me (Pointing her fingers towards her) ... is, they are discriminating not only us but also our children. They don't allow their children to play with our children... The best example is, my child is under ART as I am... When my
child plays with other children, the communities often tell these children not to play with this boy...

Knowing this fact, I also say to my child not to play with them... And, my kid, in turn, asks’ me “why they say like this?”...and “why don’t you let me to play with them?”.... That is why I don’t let him do so... (Being in melancholy or low-spirit... as her eyes are full of tears, her speech interrupts, ....wiping out her tears, all persons there fell in a sheer silence for minutes;) ...(After a while, she ended up her speech); the community is imposing discomfort on me. ...

(W4_FGD1)

As is seen in the aforementioned response, the PLWHs were forced to live under strong pressure due to the ill-advised discrimination imposed on them by the community; which, in turn, could aggravate the individual’s health circumstances. Such practices of stigmatization were not only limited to the victims, but also on the lives of their children who did not have any accountability on their parents’ health status. From this, one can deduce that getting support from others is a sort of luxury life or is unthinkable for them under such a condition. Hence, any future intervention actions that is to be planed among those PLWHs to promote their attitude about the study concepts to take the negative impact that stigma and discrimination imposed on them a need to be discouraged first.

Insufficient structural actions as a discouraging nurturer

The different organization’s structures associated deficient actions’ was the phrase emerged as a discouraging nurture of the current attitude that the PLWHs hold towards the concept of the study.

With this respect, few of the interviewees replied during the interview as:

“... On the other hand, the health practitioners working in the institution never tell us clearly that the cause of our illness is associated with the drug or not...They see us off providing the routine treatment.... It would have been better if they had helped us create desirable awareness; especially on metabolic diseases what you have told us right now...When we come for medication, they never gave us pieces of advice in relation to our feeding situations...” (W2_FGD3);

The above quotation reveals that of those, the government systems deficient action, primarily the abandon role of the healthcare organizational structure was the phrases identified factors affecting the current attitude of a person holding towards that theme. The problem is directly associated with the health workers little efforts’ to give the required information to those PLWHs in the regular basis.
And, this vividly indicates the real picture of the problem under the study. In connection with the above contexts, one respondent said:

“... Every community varies according to each household. A given family differs from another family... Some are educated, and some are not educated... As compared to these, the uneducated community rarely does so in such activities... To your surprise, we come across people who do not have any know how about HIV, let alone about the drug of HIV, during our door to door service... Imagine! How many years have gone out since HIV was introduced into our country... What does this indicate? It indicates that the activities being carried out are insufficient. Therefore, such a problem will not be solved unless the government works along with the community... Be in... in educational institutions... Even on this issue, it’s not as such done.... No one ever thought of other related health problems...” (W4_FGD1)

“....Currently, there is no organization engaged in providing health-related aids and awareness creation education in the area. In the previous time, there were some. There was an organization called “Medan Act”, for example... It went out a long time ago...” (W2_FGD3)

The subject pointed about the inadequacy of activities made in the area, following the restrained role of the local system or structures to nurture the attitude of the PLWHs toward health in general and the theme of the study in particular. In a nutshell, it reveals that the health practitioners, the uneducated family, as well as the uneducated community members are deemed to be as the principal discouraging player of individual’s positive health behaviour. One of the overarching concerns found in relation to this structure was about the previous nurturing role-played by Medan-Act, and Tesfa-Goh association which had been working in the zone. However, their interrupted present role of the associations’ concluded as hindering nurture of the personal current attitude about the study concepts (S3_Table 3 respondents_Suplimentary_Data). With this regard, comparable ideas were also raised by the research team during the discussion, and in the data set formed via the interviews undergone with the health care providers (see S4_Table 4 researcher debriefing and health workers _Data).

Practice associated behaviour
Positive practices
Healthy feeding habit as positive practices

With regard to feeding habits, the participants’ replies extracted from the entire data set stipulated a list of words and phrases hereunder. In this respect, the habitual consumption of vegetables such as Cabbage, Carrot, Tomato, Swiss chard, Pimento (locally known in Amharic as ‘Daattaa’), Sweet Potato and Potato were types of food identified as a positive feeding habit associated contexts with the extracted participants’ response from the entire data set. For example, as is stated below some of the interviewees said:

“... I believe that our feeding style...., if possible using our habitual food is like... Vegetables, Tomato, Sweet-Potato, Potato, Carrot, Tomato, Swiss Chard Cabbage, and Pimento (locally called in Amharic as ‘Daattaa’)... " (W5_FGD1)

Further, the study reveals that the habitual use of fruits entailing Avocado, Banana (known locally in Amharic as ‘Totta Muzz’ or Monkey Banana, in English), and Mango, were also the type of food items seen and grouped as the other form of feeding habit associated contexts, that apparently identified in the responses of the PLWHS as the measure, which is scientifically proofed as having a positive health impacts. The examples quoted interviewees’ response below can affirm the fact as:

“...eating ... fruits, Avocado, Mango and light food items which do not discomfort us; as well as overall improving our feeding system....help us to keep ourselves from such related health problems”(W8_FGD1)

Overall, the study finding demonstrated that all the factors associated with healthy dieting habits entailing eating vegetables, and fruit illustrate the PLWHs perceived positive knowledge and attitude towards those feeding habits that are deemed to have positive impacts to reduce the syndrome among the PLWHs. However, it lacks a word, which shows its link with the theme under the study, and to disclose the compulsory rate and extent of the existed practices underway by the PLWHs. This could be explained as due to the inadequate knowledge and unfavorable attitude of the PLWHs towards healthy diet leads those to develop inadequate positive feeding practice.

Existential practices
The feeding of locally noble foods as existential practices

According to the data collected, little snippets from the participants’ response were identified as existential feeding habit related words and phrases, as the prevention measures of the risk factors MS. To illustrate one below:

“…I believe that our feeding style...., if possible using our habitual food of baked ‘Koochoo’ and gruel made of ‘Bulla’ (i.e. locally called as ‘Bulla-Atimit’ are suggested.... Unless ... the drug we take for the virus may poison and kill us....” (W5_FGD1)

It has been illustrated in the aforementioned data extracted from the interviewees, the long-lasting habitually eating of food items, entailing baked ‘Kochoo’ (i.e. the cultural identity of the ingredient used called in Amharic as ‘Kochoo’) and ‘Bulla’ prepared in the form of porridge (i.e. known in Amharic as ‘Bulla-Genffo’) and gruel (i.e. locally called as ‘Bulla-Atimit’) were the catchphrases emerging under as existential feeding habit associated practices. These ingredients (i.e.’Kochoo’ and ‘Bulla’) are produced from a plant known in Amharic as ‘Enset’ (i.e. false Banana) that are extracted from the root section of that plant. They are an organic, locally endemic, indoor prepared, and culturally accepted food items with the highest social values and with no, any scientifically proofed evidenced health hazards in general and the theme of the study in particular. In addition, ‘Injera’ together with ‘Wot’, also seen idea as the other existential feeding associated practices that apparently identified in the responses of the PLWHs grouped under such practices. The examples quoted interviewee’s response below can affirm the fact as:

“.... Despite the frequent use of ‘Injera’ has a positive health impact, ....particularly, ...the use of ‘Shiro-Wot’ than ....together will have a better outcome.” (M1_FGD4).

As is in the above-indicated extract of the participants’ the term ‘Injera’ refers to the name given to the culturally legend, well-known, and the most widely used food item in the area in particular in the
whole country Ethiopia in general for a long. It is commonly prepared with the cereal name called in Amharic as ‘Teff’. It’s often eaten by using an indoor stewed sauce called in Amharic as ‘Wot’, might be prepared using a number of ingredients such as ‘Shiro’ (i.e. gray colored flour type, prepared with the processed pea, bean, chickpea cereals) or ‘Sigga’ (i.e. the name given in Amharic for animal meat). The cultural identity of ‘Shiro-Wot’ and ‘Sigga-Wot’ are generated from the ingredients used to prepare that particular ‘Wot’. Overall, such feeding habits are a culturally legend habits, not only in that society, but also all over the country. But, its nutritional values are not yet known well and also it lacks scientifically proofed impacts in the progression of the syndrome among those PLWHs. This implicated the significance planning of further confirmatory studies in that regards using these subjects.

**Negative practices**

**Unhealthy feeding habit as negative practice**

With this regards, eating raw meat (i.e. called in Amharic as ‘Tire-Sigga’) was concepts that emerged from the data set. Almost all the under selected interviewees reflected this concern in their responses as:

“... *I perceive that the prevailing habit of feeding often raw meat often here as one* ...(M8_FGD2)

As is revealed in the above mentioned extract, eating raw meat (i.e. called in Amharic as ‘Tire-Sigga’) is the culturally preferred food type that habitually practiced by the vast majority of the community in the country in general and by the majority of the population in the study area in particular. Similarly, as the following few extracts from the participants indicates as:

“... *Most of the time, it is noticed that people often use fatty food items here*....”(M3_FGD2)

The habit of using of high-fat gorgeous food items was also identified from the data set as an expression related to a bad feeding habit. What’s more about such feeding habit, the use of the food item called in Amharic as ‘Injera’ with Meat ‘Wot’ (the sauce prepared using ingredient meat called in Amharic as ‘Sigga-Wot’) was the other issue that also apparently seen as negative practices. In this respect, the participants said as:
“... In my opinion....our habit of eating ‘Injera’ with ‘Wot’ prepared with meat as an ingredient (i.e. called in Amharic ‘Sigga-Wot’) is a sensible food ... You know why? ...such food items are good for people like us (living with HIV-infection) to be free from any health problems, including the kind of disease that you talk now...and even to get strength ...“(W3_FGD3)

In short, the finding comprehended that eating raw meat, fat-rich foods and eating ‘Injera’ with ‘Wot’; are scientifically evidenced bad feeding habits due to the fact that they are a known protein and fat-rich sources of food items. The uses of such food items have scientifically verified negative health impact associated with this study theme.

Running of a sedentary lifestyle as a negative practice

Concerning sedentary habits, the participants’ replies extracted from the entire data set stipulated a list of words and phrases here below. The quoted interviewee’s response below can affirm the fact as:

“... You know what? ... While you live with the virus... this doesn’t give you time, rather exposes you to various illnesses... and this, let alone to give you chance to perform exercise, rather it imposed you to fail to get your daily bread ....spend much of your time in bed....“(M3_FGD4)

The responses of the interviewees comprehended that the development of a various opportunistic infection accounted from the HIV-infection deemed the PLWHs to fall into in bad health states, and this eventually forced them to run a bedridden life. In relation to this, one of the overarching issues appeared from the above participants’ responses were about the enhancing enabling factors the PLWHs to develop behavior of this regard. The following quotation can be taken as an example.

“....however ... it is difficult to try to even to think... due to the inadequate power, we experienced... and economic problems encountered succeeding with the disease we live in...Such as to secure our daily bread and other things, which are basically essential to perpetuate health ...“(W7_FGD3)

It reveals the inadequate power and the economic problems come upon typically due to the virus and the daily intake of antiretroviral therapy (ART) drugs were emerging as a particular hindrance of the PLWHs to have such a sedentary behavior. On top of that, a few of the extracts from the participants’
response said as:

“... Another point is... due to being jobless, many people are spending their time idle.... This, in turn, entails them to be exposed to the health problems which we discussed earlier...” (W5_FGD3)

The search of jobs, being jobless, hate of schooling, and other legal restrictions are found to be as a factor other than the HIV infection that pushes the PLWHs to have the habit of that regard.

**Harmful substance use habit as a negative practice**

Equally, harmful substance use habits related concepts were also emerged from the data set as a factor linked with alcohol use habit, smoking habit, and chewing ‘Khat’ and grouped under a negative practice. In relation with Alcohol use habit, the extracts from the respondent’s state as:

“...the youth, as they are most addicted, uses the wage from daily labor for ... especially, drinking ‘Areke’ to get drunk.... (M2_FGD4)

As it denotes in the upper mentioned participants’ replies, the use of alcohols associated habit apparently identified from the entire data set as an expression related to harmful substance use habit that is grouped under the same category. In connection with, the type of homemade alcohols habitually used by the respondent; while the indoor prepared alcohols are called in Amharic as ‘Areke’, Tajj’and ‘Tella’. The remaining alcohols were Beer and Wine (alcohol prepared with the plant called grape, called in Amharic as ‘Awash’ or ‘Wine-Tejj’), which are industrialized alcohol types that is attributed with the practices of that regards. In association with this concept, for example.

“... As has been known, the big problem of living with HIV is .... You often get irritated due to the disease... so, we ..., and drink alcohol in order to forget the annoyance.... and, health professionals most often advise us that it causes another health problem.... Conversely, we keep using it covertly ... by ignoring their advice ...Hope, we better quit our bad practice.” (W3_FGD3)

One participant reacted in a different way. She revealed that irrespective of the advice given by health professionals, they often prefer to engage themselves in such practices covertly, due to the enabling power that habits give rise to the PLWHs to overcome their anger, experienced as result of
HIV. This, in turn, shows the impact of the virus on the progression of the PLWHs perceived positive perception towards that habit. On top of this, in connection to harmful substance use habit, the smoking-related context was apparently emerged as in reflected in the response below.

“... People living here, most of the time, are exposed to unnecessary addictions such as...smoking cigarette ...”(M7_FGD2)

It repetitively pinpointed that smoking cigarette as a harmful substance uses associated habit that has a negative health impact. In this respect, a subject said:

“... As has been known, the big problem of living with HIV is ...you often get irritated due to the disease... so, we may sometimes smoke a cigarette,..... and, health professionals most often advise us that it causes another health problem... we keep using it covertly ...by ignoring their advice ...Hope, we better quit our bad practice.”(W3_FGD3)

As the extract data from participants' indicated that irrespective of the advice given by health professionals, the PLWHs often prefer to practice smoking cigarette covertly, due to its benefit associated with the temporary anger regression capability. In general, this habit illustrates the enabling impact of HIV infection environment to aggravate the chronic diseases as a whole, and MS in particular (S3_Table 3 respondents_Suplimentary_Data). In relation to this theme, the research team during the discussion and in the data set formed via the interviews undergone with the health care providers also partially raised comparable issues (see S4_Table 4 researcher debriefing and health workers _Data).

Discussion

Generally, the study verified that the absence of adequate knowledge regarding the phenomenon under study leads to the unfavorable attitude and inadequate practices. Undeniably, the cultural identity dimension of persons, extended family, and the neighborhood was perceived to all shares for the growth of health-related knowledge (26, 32–35, 37–41). An overall purpose of this domain was to identify patterns of thought, influences of prevailing knowledge from the individual response.

Consistently, in the current study perspective, the PLWHs are individuals (persons) that may or may not have an extended family, and who lived within a neighborhood. Their acquisition of health
information encompasses mainly from personal experience of serious disease tragedies. Family, in particular, the spouses (the husband at large and the wife), children, sisters, and brothers have been demonstrated to be the primary source of education on MS risks. Few educated individual tragedies in the diseases and death of family members. Government structure, mainly the health care structures; the religious organization, and the social calls ‘Idir’, to get the message out concerning health. Though the effort made by all stakeholders to promote the PLWHs health knowledge were restricted on Communicable diseases (CDs), primarily focused on HIV/AIDS and its treatment, but it is to be taken as a means of a formal acknowledgment of the pivotal role played by all and then, start a conversation about some bottomless concerns of those subjects within the local sociocultural contexts.

As well, the sub-domains of perceptions, enablers, and nurturers of the PEN–3 model is an expression of how various individuals, economic and political systems, cultural constructs, and institutions shape and support healthy habits is to be explored. (26, 32–35, 41–44). Congruently, the finding from the current study revealed that the perceived severity of living with the virus grounded with, the social, economic and cultural values directives as factors associated with the dearth of contextual knowledge, and contributed the PLWHs to have an unfavorable perception about the contexts under investigation. Besides, the remaining two domains are likewise vital to exploring the encouraging and the discouraging factors to which individual attitudes, beliefs, and actions are enabled, mediated, and nurtured. Consistent with the current study likewise indicated subjects on the personal situations, the family contexts, the system-level factors as reinforcing and discouraging enabling and nurturing factors for the growth of current attitude about the study contexts. This signified that regardless of the enhancing enabler and nurturing factors role-played on the transformation of the lives of the PLWHs to have perceived positive attitude about healthy habits. Equally, the hindering enabler and nurturing factors have contributed to developing the negative attitude that facilitates the occurrence of the syndrome. These all are an aspect of the sociocultural contexts in which the PLWHs in Gedeo Zone live. Hence, all the encouraging enabling and nurturing factors ought to be promoted and the hindering to be discouraged.
The cultural empowerment domain of the PEN-3 model is intercepted with the conceptual framework of practices associated with health behavior. It is essential to identify the impact of sociocultural contexts of individual lifestyle practices, further classified as positive, existential and negative, to differentiate the practices of one holding either to be encouraged or put an end to their health condition (26, 32–35, 41–44). Correlating with the current study was revealed that the habit of eating vegetables (eg. Sweet potato and Cabbage) and fruits (Monkey Banana and Avocado), restricted harmful substances use (i.e. any alcoholic drinks, and smoking cigarettes,), intentional physical activity were notified as positive practices that the PLWHS perceived prevent measures associated behavior MS. Besides, the result described that the long-lasting habitually eating of ‘Kchoo’, ‘Bulla’, ‘Injera together with ‘Wot, were emerging as existential practices that are locally practiced noble habit, with no any scientific evidence on the progression of MS. Furthermore, the habit of “eating raw meat’, running sedentary lifestyle, the use of locally prepared Alcohol ‘Areke’ ‘Tella and ‘Tejj, and smoking cigarettes were the practices that might lead the PLWHs to advance a negative health outcome. This implicated that any of the positive and existential perception, enabler, and nurturing factors that may lead to a positive health outcome need to be promoted and recognized. And, the negative practices that the community tied up should be taken in to account and needs to be resolved, although they are a culturally preferred habit that many practiced.

Limitation of the study
Lastly, in spite of the various good aspects, the current study has a number of limitations emerged with recall bias that people inquired about their past actions, relations, and support they get from any relevant others, the nature of phenomenological study approaches employed, the use of non-probability sampling techniques, along with the unique features of the sociocultural contexts to generalize the finding get from one area to the others.

Conclusion and public health implications
Coding the responses of the interviewees based on the conceptual framework of KAP, were undertaken after an extensive review of the text documents created from the interviews. Fortunately, the larger proportion of the responses for knowledge dropped into this group Likewise, the higher numbers of the responses about attitude were grouped into unfavorable, even if certain shown that
there were quiet efforts in assuming or keeping an attitude that would lead to the improvement of practices that were intended to prevent, diminish risks for or control of MS. Lastly, the majority of responses to practices were considered inadequate (S5_Table 5 research questions, conceptual framework, participant responses) (Fig 3 attached. pdf). And this affirmed that the question of whether knowledge of MS and its risks, attitudes of personal concern for health, and dietary and physical activity practices affect upon was replied undeniably. This implicates having recognizing the long-lasting unique habits of eating ‘Kochoo’, ‘Bulla’, ‘Injera’ with ‘Wot’, and the adoption of the dietary habits of eating plenty of fresh fruits and vegetables for three or more days per week coupled with purposeful physical activity, and restricted harmful substance use habits would enable for better control of the syndrome and its risks of NCDs.

Therefore, Dilla University referral hospital, Gedeo-Zone health bureau, and other health care institutions are providing the chronic HIV care service in the zone together with the corresponding health workers to take the initiative in providing health education to the PLWHs in the regular basis. The aim is to equip the PLWHs with simple tools that will enable them to better function within the role so many have chosen or been thrust into. Within the program, emphasis can be placed on the training of the PLWHs on the reduction of lifestyle-associated risks and then build their knowledge, attitude and practices against the incidence of MS and controlling of NCDs risk at least in this segment of the general population. This will enable the sustainability of health education in the community, meanwhile, the PLWHs can benefit. In this regards, if the PEN-3 model is adopted across Gedeo zone, Southern Nations Peoples (SNNP) regions and in the country, the task of meeting the health education needs and the reduction in the incidence and prevalence of MS and NCDs among the PLWHs could be more achievable.

**Abbreviations**

AAU: Addis Ababa University; CHCCs: Chronic HIV care clinics; DURH: Dilla University Referral Hospital; FGDs: Focus Group Discussions; FP_Ind: Female patient participated in the in-depth interview; HIV: Human Immunodeficiency Virus; MS: Metabolic Syndrome; HW_Ind: Health worker participated in the in-depth interview; Ind: In-depth interview; KAP: Knowledge, Attitude and practice; M_FGDs: Men
participated in the FGDs; MP_Ind: Male patient participated in the in-depth interview; PLWHs: People living with HIV infection; RTR_FGD: Research team’s reflection from the FGDs; SNNP: Southern Nations Nationalities Peoples; WHC: Wonago Health Center; and W_FGDs: Women participated in the FGDs

Declarations

Ethics approval and consent to participate: All the principles of ethics laid down in the Declaration of Helsinki, and its successive amendments were applied for this study. Hence, ethical clearance was obtained first from Addis Ababa University (AAU) College of Health Sciences school of public health Research and Ethics Committee (REC) (Ref.No.SPH257/09) then from College of health science Institutional Review Board (IRB)(Meeting No.001/2017 and protocol No.0069/16/SPH). Furthermore, the official letter was produced and delivered by the author to the respective Southern Nations Nationalities Regional health bureaus, Gedeo zone and Woreda health bureaus and all of the institutions selected to conduct the study. Data were collected unlinked anonymously, without any personal identifiers. Each individual was enrolled entirely voluntary after written consent was obtained. Any information obtained during the study was retained with the greatest confidentiality.

Consent for publication: Not applicable

Availability of data and materials: All data generated or analyzed during this study are included in this published article [and its supplementary information files].

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Figures

Figure 1

Adopted PEN-3 cultural model constructs, Phenomenological-study, PLWHs, Gedeo-Zone, Sothern-Ethiopia, 2018
Adopted study conceptual-framework, the emergence of KAP, through PEN-3 domains, Phenomenological-study, PLWHs, Gedeo-Zone, Southern-Ethiopia, 2018
Figure 3

A schematic summary of PLWHs comments from the discussions sociocultural contexts of MS risks, Phenomenological-study, PLWHs, Gedeo-Zone, Southern-Ethiopia, 2018

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