

Barriers in Adult Vitamin D Service Provision by Health Care Workers: a Qualitative Study in Three Ecologies of Ethiopia

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Abstract

Background: Adult vitamin D deficiency, a public health problem in low-income countries, is correlated with increased mortality. Although health care workers (HCWs) in Ethiopia are educated on minerals counseling on the benefits of vitamin D and its sources is not witnessed since their knowledge is low. The main aim of this study is to explore barriers to good knowledge, positive attitude, and practice of health care providers on adult vitamin D.

Methods: An exploratory qualitative study is done in three ecologies covering highland, midland, and lowland. The size of 27 participants was fixed by saturation of ideas. In-depth interviews were conducted among leaders and HCWs of different professional groups in health centers and hospitals. Moderators were Ph.D. holders. An interview guide was developed after reviewing research that was translated into the local language. Interviews were audio-taped, transcribed and, translated. Open Code software was used to code and categorize the data. Thematic analysis is presented using themes and sub-themes.

Result: The main barriers are related to health systems, HCWs' understandings, health facilities, and the educational system. Lack of attention by the health systems' leadership, missing adult vitamin D as a priority in health programs, and the absence of adult vitamin D management and treatment guidelines are barriers related to the health system. On the other hand, health care professionals believed that the prevalence of adult vitamin D deficiency is insignificant and vitamin D deficiency is only an issue related to children. Besides, the inadequacy of laboratory investigation and limited in-service training are barriers related to health facilities while the absence of studies and the focus of the medical curriculum on child vitamin D are barriers related to the education system.

Conclusion: Adult vitamin D deficiency is a neglected public health problem with many barriers related to diagnosis and treatment. Barriers are related to the professionals themselves, their leadership, health facilities, and the education system. The government should give attention to adult vitamin D management and treatment, continuous on the job training, development of guidelines, purchase of laboratory equipment, the inclusion of adult vitamin D in pre-service and, in-service training curriculums.

Background

Several studies showed that Vitamin D is essential for bone health, extraskelatal tissues, in regulating cell growth and cancer prevention, boosting immune function and infection control and, also in blood pressure regulation and cardiovascular disease. Low vitamin D status has been strongly associated with increased overall mortality (1-3).

Skin synthesis through exposure to ultraviolet B radiation is the vital source of vitamin D. However, even living in the equator does not ensure vitamin D sufficiency (4, 5). Fatty fish and fish liver oil are among the few natural food sources for vitamin D.

Health care providers should consistently educate their communities on the uses of vitamin D and its possible sources. However, Sporadic surveys done in different parts of the World including sub-Saharan Africa indicated that the level of knowledge, attitude, and practice on adult vitamin D deficiency among health care providers is not as expected.

Many health professionals are unable to effectively provide nutrition counseling including vitamin D which may be related to inadequate training, resulting in inadequate knowledge, skills, and low confidence to provide nutrition care(6, 7). This problem may arise from the different barriers at different stages of the health system, such as low priority given to nutrition education during medical school, inadequate faculty to provide nutrition training(8, 9).

However, there is limited information with regards to this issue and no study is conducted which document the barriers to good knowledge, positive attitude, and practice in the African context which warrants the conduct of such a study in one of the most populous countries with varied agro-ecological zones, Ethiopia.

The main aim of this study is therefore to explore barriers to good knowledge and positive attitude and practice of health care providers on adult vitamin D in selected ecological zones.

Methods

This descriptive study was an exploratory design to produced qualitative data on barriers towards good knowledge, positive attitude, and enhanced practice of health professionals on adult vitamin D deficiency. The study was conducted in three ecological zones covering highland, midland, and lowland (Addis Ababa, Menze-Gera and Qewot Districts) of Ethiopia.

The size of participants for the study was determined based on the saturation of ideas. Based on that 27 in-depth interviews were conducted to understand the perceptions of health care providers towards some of the barriers towards good knowledge, attitude, and practice on adult vitamin D deficiency. Technical leaders of selected health facilities (medical directors and the like) were recruited as key informants from each selected facility. These participants were also from the different professional groups in health centers and hospitals.

Besides, key informants were also recruited from programmers in the health sector including responsible unit head/program officers from the Federal Ministry of Health, regional health bureaus, and Ethiopian Public Health Institute (EPHI).

A total of three Health professionals who hold a PHD in public health and research experience were recruited as data collectors and the principal investigator was their supervisor. Training for the field staff was provided. Intensive supervision was also done.

The questionnaire was developed after reviewing pertinent researches done on the issue. The questionnaire was translated into Amharic. The interviews were semi-structured and took place in a quiet

room. The interviews lasted between 30 and 40 min. The key informant interviews were audiotaped. Notes were taken during the interview by the research assistant. The interviews were moderated by the Principal Investigators of the project. Each interview was fully translated and transcribed. Open Code Software was used to code and categorize the qualitative data. Themes were developed from common issues mentioned by the participants. The data was then analyzed using thematic analysis.

Results

The findings of the study are presented using the main themes and sub-themes against the objective of the study. The main themes include barriers related to the health system, barriers related to health care professionals, barriers related to health facilities, and barriers related to the educational system.

1. Demographic characteristics of study participants

In the study, 27 key informants who had direct relationships and responsibilities with the subject matter were involved. Those included people who had been working in the health system, for instance, FMOH, Zonal health bureau, district health offices, hospitals, and health center. Their detailed demographic characteristics are provided in table 1 below.

Table 1: Demographic Characteristics of study participants

Variable	Value	Number of participants
Study Region	Menz-Gera	8
	Qewot	7
	Addis Ababa	12
Sex	Male	24
	Female	3
Service year with the current position	<5	7
	5to 10	8
	>10	12
Profession	Nurse	9
	Health officer	8
	Medical doctor	7
	MPH	3
Place of work	FMOH	1
	Hospital	7
	Health center	14
	Zonal and district health office	4
	EPHI	1

2. Barriers related to the health system

The Federal Ministry of Health is responsible to formulate health policy, set standards to deliver health care in Ethiopia, and provide strategic direction to health delivery services. Failure in commitment and inadequate understanding of health problem by higher officials will result in poor service provision in a lower level of health facilities

2.1 Lack of attention to adult vitamin D deficiency at federal, regional, zonal, and district level

Unlike other micronutrients, adequate attention is not given to vitamin D deficiency especially adult vitamin D is ignored as a program. Adequate attention is not given to adult vitamin D in federal, zonal and district level leave along at the lower level of health facilities. In line with this, the respondent from the ministry of health mentioned that *“In adults, I have not seen any commitment and efforts to do interventions to alleviate problems related to vitamin D deficiency.”* (k27)

The city administration and district health office did not also incorporate vitamin D related activities under their programs and are not given any support or supportive supervision regarding adult vitamin D. The respondent from Addis Ababa health bureau stated that *“The problem of adult vitamin D did not get the required attention from the government. In fact, I do not know what health facilities are doing. But in my department, we are not doing anything related to adult vitamin D deficiency.”* (k26)

Another respondent from Menze-Gera also commented that awareness creation was not done by higher officials in the health sector and the area is not well studied. The respondent said *“No awareness was created from top management to health care providers. It is not known whether the problem exists. It has not been studied.”* (k01)

2.2 Adult vitamin D is not included in routine program or report.

Unlike other micronutrients deficiencies, vitamin D deficiency especially among the adult population is a neglected area. The respondents believe that the reason for low levels of knowledge, attitude, and practice of adult vitamin D deficiency is related to the low attention and support given by zonal health departments and district health offices. One of the respondents from the Arada health center in Addis Ababa mentioned that *“When senior officials come to health centers whether to supervise or for supportive follow up, they use checklists for Iron and vitamin A. they would do the same for vitamin D if they give enough attention to it.”* (k20)

There are sixteen packages/programs that are included in the health extension program; unfortunately, adult vitamin D is not included in the list. The respondent from the Feresmeda health center in Addis Ababa mentioned that adult vitamin D is not included in the outreach program. This is what she has to say in her own words *“This health center is famous in outreach activities. From what has been designed by the government, vitamin D is not included in the program. We use different formats to observe health problems and conditions; vitamin D is not included in it.”* (22)

Vitamin D deficiency is not also included under monthly reportable health problems or conditions by health centers or hospitals in their monthly Health Management Information System (HMIS) reporting format. The respondent from Menze-Gera also stated that *“We do not include adult Vitamin D in our plan and have not been included in a report, or reported it on our monthly HMIS reporting.”* (k02)

2.3 No guidelines or manual prepared by health bureaus for adult vitamin D management

Lack of guidelines or manuals prepared on adult vitamin D deficiency management and treatment is also mentioned as one of the reasons for the low level of knowledge, attitude, and practice of health care professionals on the diagnosis, management, and treatment of adult patients with vitamin D deficiency. The respondent from the federal ministry of health witness that there is no separate guidelines for vitamin D management and treatment. According to the key informant *“There is no clear guideline about Vitamin D deficiency diagnosis, treatment and management.”* (k27)

He also added that, even in the micronutrient guideline, detailed attention was not given to adult vitamin D deficiency and only two-line statements are incorporated in the micronutrient guideline related to vitamin D deficiency. Here is what he has said *“Yes, there is but it is only two lines within the micronutrient guideline.”* (k27)

A respondent from the Ethiopian Public Health Institute, which is the research arm of the ministry of health also admitted the issue and the reason for not having a separate guideline for vitamin D diagnosis, management, and treatment are because of low attention given to the problem. He said *“...we did not prepare adult vitamin D deficiency guidelines and there is no intervention to have it soon. So, we did not give the required attention and address the problem.”* (k25)

Moreover, study participants who are front line health workers in different health facilities confirmed the views of program leaders. A respondent from Feresmeda health center in Addis Ababa replied the following when asked if there is any manual or guideline for adult vitamin D deficiency *“To tell you the truth, there is none.”* (k22). Another respondent from Menze-Gera also stated *“There is also a problem with the diagnostic system as we do not have guidelines for the investigation of the same.”* (k03) The same respondent also added that he did not know whether there is a separate guideline for vitamin D. *“There is no dedicated guideline for this. I don't know whether or not there is a separate guideline for vitamin D.”* (k03)

3. Barriers related to health professionals

Health care professionals play a central and critical role in improving access and quality of health care in a community by promoting health, preventing disease, and deliver health care services to individuals and families. So, any knowledge gap in this vital group may result in poor utilization of health care services and poor quality of life in a community.

3.1 Health professional believes that the prevalence of vitamin D is very Low

Most of the respondent believes that the prevalence of vitamin D especially among the adult population is very minimal and it does not require special attention, unlike other micronutrient deficiencies.

One of the respondents from Qewot district, which is a lowland area, working at a health center when asked about the prevalence of vitamin D in adult population replied that *“Till now there is no any special thing on adults. But there is no evidence or confirmation.”* (k09)

Another respondent also added that *“The vitamin D deficiency problem is not significant in the area, in my work experience as I have seen only around two cases on vitamin D.”* (K10)

On the other hand, there has been another respondent that thought the low prevalence rate of adult vitamin D reported by the health facilities might be related to the knowledge gap of health care professionals. A respondent from the Feresmeda health center in Addis Ababa mentioned that *“ They may*

not come to us or we didn't find it. Or it might be because of the health professional's ability to diagnose but until now, we haven't seen any case" (k22)

Another respondent added on the same issue. He believes that not only the wider community but also health professionals do not have an awareness of adult vitamin D deficiency and we are not practicing anything at all. A health care provider from the Saris health center in Addis Ababa also mentioned that *"To tell you the truth, there is no movement on adult vitamin D at all. There is no awareness creation. We do not have the awareness about the problem from the beginning."* (k23)

3.2 Think vitamin D is common phenomena in children not in adult

The common issue mentioned by most of the health care providers is that vitamin D deficiency is a major problem in children than adults. One of the health care providers from Feresmeda health center mentioned that: *"Most of them don't have an awareness, even health professionals consider vitamin D deficiency in children, not in adults."* (k22)

The same view is shared among professionals in health program leadership. The respondent from the federal ministry of health mentioned that some health professionals do not have a clue in the presence of vitamin D deficiency in adults. *"Health professionals, not only unable to diagnose and treat adult vitamin D deficiency but also did not know the presence of adult vitamin D deficiency."* (k27)

The respondent from EPHI, which is the research wing of the ministry of health, has the same view. He said *"Attention is given to children but not to adults. The health professionals did not give attention to adults."* (k25)

The same respondent also added that because adults spend most of their time in outdoor activities, they have enough access to sunlight exposure, so they are at less risk for vitamin D deficiency. Here what he said in his own words *"Most of the adults unlike children stay outside their home and have the chance of getting sunlight exposure. As a result, there is no report on adult vitamin D deficiency and the lack of evidence makes people not to consider the problem among adults"* (k25)

The same view is shared by health regional and city administration staff. A respondent from Addis Ababa health bureau mentioned that he has no clue about adult vitamin D. *"I do not know about adults."* (k26)

4. Barriers related to health facilities

It is known that the ultimate aim of any health facility is the attainment of better health care service to the catchment area community. Though a lot in health care service delivery is improved in Ethiopia, there are still gaps that halt health facilities from achieving their objectives.

4.1 No adequate laboratory investigation

The frequent problem mentioned by study participants that hinder them from identifying and diagnosing vitamin D among the adult population is related to a shortage of laboratory equipment.

A respondent from Menze-Gera district, the coldest high land district, mentioned that *"We have no resources, no diagnostic equipment to conduct laboratory testing."* (k04)

Resource shortage was also mentioned by hospital staff in Addis Ababa. A study participant from Yekatit 12 memorial hospital in Addis Ababa also said *"... For example, we do not have electrolyte test in this facility."* (k24)

4.2 No capacity building scheme

On the job training is the commonest way of building the capacity of health care professionals in different health-related programs. However, respondents reiterated that almost no in-service training or capacity building on adult vitamin D deficiency diagnosis, management, and treatment was provided to them. The participant from Hayat health center in Addis Ababa stated that the knowledge gap regarding adult vitamin D deficiency may be related to the unavailability of on job training in the area. The respondent when asked about the reason that he never hear or see any case of adult vitamin D deficiency, he replied that *"Maybe it's because of lack of training and awareness."* (k19)

Another key informant from Menze-Gera health center also said that he did not get any in-service training in the area is unable to diagnose the problem of adult vitamin D deficiency. *"... I didn't get any more training besides that. I can identify the problem on children. But on adults I am less likely to do that..."* (k06)

Key informants working in health program areas do not have a different view. A respondent from North Showa health department mentioned that *"By chance, I have taken a limited course in the college but there is no in-service training after."* (k07)

The issue is not also different for health care providers working in the capital, Addis Ababa. A respondent from the Saris health center, in Addis Ababa, said he believe that to increase knowledge and practice, training should be given *"I recommend that skill and capacity of health professionals should develop through training."* (k23)

5. Barriers related to the education system and research

5.1 Inadequate pre-service training

Most of the respondents believe that their knowledge gap related to adult vitamin D deficiency is attributed to the failure of the curriculum to incorporate adult vitamin D in adequate number of credit hours.

One of the participants from Arada health center in Addis Ababa responded the following with regards to pre-service training *"No. That is why we fail to handle such problems in this"* (k20)

It is complemented by the view of a study participant recruited from a health center staff in Menze-Gera district in Amhara region *"While in school, we didn't learn how to measure and know vitamin D deficiency."*

(k05)

5.2 Curriculum focused only on children

Study participants indicated that even the minim credit hour course on vitamin D deficiency focused on children without mentioning adults. The key informant from EPHI mentioned that *“All programs related to vitamin D deficiency is related with children. The curriculum content did not take in to account the adult vitamin D deficiency.”* (k25)

The respondent from Menilik II memorial hospital augmented that *“We have learned about adult vitamin D deficiency and it is well addressed in the curriculum. But it is not to the details like child vitamin D deficiency. We have learned that the problem exists but not to the details.”* (k21)

5.3 No adequate research is done to show the magnitude of the problem,

No supporting research is done in the area that shows the magnitude of adult vitamin D deficiency among the adult population in Ethiopia. The study participant from EPHI, the research wing of the ministry of health, mentioned that because there is no research done in the area it is difficult to tell whether the problem exists or not. Here is what he said *“Like other vitamins, our institution has the capacity and facility to research vitamin D deficiency and other researches on minerals. But there is no much research done on vitamin D deficiency. We did not know the magnitude and distribution.”* (k25)

An expert from Menelik II memorial hospital supported the view of the previous respondent as follows *“To conclude whether it is the problem of the community or not, there should be a research in the community. We are not doing screening activities. We do not have any kind of data on the condition, either.”* (k21)

Discussions

In this study, we evaluated barriers to good knowledge and positive attitude, and enhanced the practice of health care providers on adult vitamin D Deficiency in highland, lowland, and midland ecologies in Ethiopia.

Lack of attention by higher officials in the health sector, nonappearance of adult vitamin D in routine health programs, and absence of separate guidelines for the diagnosis, management and, treatment of adult vitamin D deficiency were barriers related to the health care system in Ethiopia. Whereas, health professionals believe that there is a low prevalence of vitamin D among adults and it is common only in children, which are barriers related to the health care providers in Ethiopia. Also, inadequate laboratory investigation and limited capacity-building mechanisms were identified as barriers related to health facilities. Moreover, limited research is done in the area, the focus of medical curriculum only on children, and inadequate pre-service training were among identified barriers related to the educational system in the country.

As shown in this study participants witnessed that educational curriculum is not sufficient to give detailed knowledge in vitamin D deficiency. Similar research in Ghana also shows that around 66% of doctors who participated in the study said they had inadequate nutrition education during medical school, and more than 70% of the participants were either unsatisfied or undecided regarding the quality and quantity of their nutrition educational experiences during medical school (10) which is also similar with other study done in USA and Australia(11, 12).

In addition to the pre-service courses, on the job training is believed to be a major anchor in developing knowledge and skill in clinical practice. But this study found that on job training and capacity-building mechanisms on adult vitamin D deficiency are non-existent that might have a significant role in the knowledge gap, attitude, and low practice of health care professionals on the diagnosis, management, and treatment of adult vitamin D deficiency. Similar studies that were done in other countries also confirm this finding. A study done in Ghana shows the majority of health care workers improve their competence related to nutrition through reading and self-directed learning. Only a very minimal number (12.1%) of the participant mentioned conferences/workshops as a means of capacity building for knowledge related to nutrition(10).

Another important finding of this study was that even the higher official from the federal ministry of health admits the absence of guidelines related to adult vitamin D deficiency. It is known that guidelines are systematically developed statements that help health care professionals to easily diagnose and treat patients and make decision making better and easy. But we do not have such a tool for adult vitamin D deficiency in Ethiopia. Even when you have such guidelines there should be tailored training on it as a study done in Canada confirm low utilization of guidelines by health care professionals (13) and another study done in Ghana also confirmed that only 42 % of health care professional use guidelines to diagnose and treat adult vitamin D deficiency(10). This finding gives an insight that the federal ministry of health can and should have done a lot in the preparation and distribution of guidelines on adult vitamin D deficiency.

According to the recent study done among the adult population in southern Ethiopia in 2013, only 15.8% of the participants had 25(OH) D levels above 50 nmol/L, which shows the high prevalence of adult vitamin D deficiency in a community(14). However, this study found that one of the barriers for low knowledge, attitude, and poor practice of adult vitamin D deficiency was related to inappropriate and incorrect assumption given by the health care professionals that vitamin D is a common condition among children than adults. This false assumption may come from the absence of studies that show the actual magnitude, inadequate pre-service training, low attention given by health system leaders at federal, regional as well as zonal, and district levels, and limited laboratory equipment in the health facilities.

Conclusions

In conclusion, adult vitamin D deficiency is a totally neglected area in the health sector. Low attention is given to it by the health professionals working in program leadership and health care practice at national,

regional, and district levels. Moreover, medical curriculums do not adequately include adult vitamin D, there is inadequate laboratory investigations in health facilities. Besides, there is a knowledge gap since health professionals think that adult vitamin D is common in children and not in adults in addition to thinking that adult vitamin D deficiency is a rare problem. Very limited research is done in the area. There are no guidelines on adult vitamin D deficiency diagnosis, management, and treatment, and subsequent on the job training. Besides, there is no organization supporting the adult vitamin D program.

Appropriate attention needs to be given by the health system leadership and need to drop it down to a lower level. Besides, repeated in-service training need to be given in addition to revisiting the medical curriculum to incorporate adult vitamin D deficiency. The laboratories in health facilities should be equipped with diagnostic kits with adequate training of staff to improve their skills. Intervention studies have to be done to get more evidence on the issue under the caption. Finally, like other programs, partners should participate in designing appropriate programs related to adult vitamin D deficiency.

List Of Acronyms And Abbreviations

EPHI – Ethiopian Public Health Institute

FMOH – Federal Ministry of Health

HCWs – Health Care Workers

HMIS – Health Management Information System

MPH – Masters of Public Health

PhD – Philosophy of Doctorate

USA – United States of America

Declarations

Ethics approval and consent to participate

Ethical clearance was obtained from Addis Ababa University, the institutional review board. Support letter was also obtained from the Federal Ministry of Health, the regional health bureau covering the study ecological zones. Besides, each study participant was asked to give oral consent to participate voluntarily; their privacy was also respected during the interview. Respondents were provided with up-to-date knowledge on adult vitamin D deficiency as part of the direct benefit from the particular study.

Consent for publication

“Not applicable”

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request

Competing interests

"The authors declare that they have no competing interests"

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Authors' contributions

WM, WA and YD were involved in the conception, design, data collection and writing the manuscript. YF, JH, BL and YZ are sub-thematic research members who were involved in the design of the project who were also involved in the interpretation of the findings. All authors read and approved the draft manuscript.

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