Original Article

Knowledge, Attitude, and Practice Regarding Vitamin D Deficiency Among Community Pharmacists and Prescribing Doctors in Khartoum city, Sudan, 2020

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Abstract

Vitamin D is a group of fat-soluble vitamins responsible for intestinal absorption of calcium and phosphate. Vitamin D deficiency (VDD) has reached an epidemic in both developed and developing countries. Literature review showed that population knowledge, attitude, and practice concerning Vitamin D were poor. Prescribing doctors and pharmacist are an important source of health information. Hence, their knowledge and practices about Vitamin D is essential for their roles and needs to be highlighted. **Objectives:** The aim of this study is to assess knowledge, attitude, and practice regarding Vitamin D among community pharmacists and prescribing doctors in Khartoum City, Sudan, 2020. **Materials and Methods:** An observational cross-sectional study was carried out from February to April 2020 among 94 community pharmacists and 106 prescribing doctors using a validated electronic delivery self-administered questionnaire in Khartoum locality. **Results:** About 32.7% and 41.9% from prescribing doctors and pharmacists had poor general knowledge, respectively, regarding VDD, while the significant trend was found regarding the level of knowledge and year of experience ($P = 0.022$) of all health professionals (pharmacists and doctors). About 39.3% and 44.1% from prescribing doctors and pharmacists, respectively, had poor nutrition knowledge score toward Vitamin D with a significant trend regarding nutrition knowledge score and different gender groups ($P = 0.02$) of all health professionals in the study. About 49.5% and 47.5% from prescribing doctors and pharmacists, respectively, had poor attitude scores toward Vitamin D with a significant trend regarding nutrition knowledge score and attitude score ($P = 0.037$) of all health professionals. **Conclusion and Recommendations:** This survey identified a gap in the general knowledge, nutritional knowledge, and attitude among health-care professionals (prescribing doctors and pharmacists).

Keywords: Knowledge, pharmacists, Vitamin D

Introduction

Vitamin D

Vitamin D is a group of fat-soluble vitamins responsible for intestinal absorption of calcium and phosphate.[1,2] Two major forms of Vitamin D exist, Vitamin D_2 (ergocalciferol) found in plants, is produced by ultraviolet B irradiation of ergosterol and can be consumed as a supplement or in fortified foods. D_3 (cholecalciferol), on the other hand, a product of ultraviolet B irradiation of 7-dehydrocholesterol, is synthesized in the human epidermis or consumed in the form of natural (for example, fish) or fortified food sources or as a supplement.[3-5]

Vitamin D is a vital vitamin, which has anti-proliferative, pro-differentiative, pro-apoptotic, and immune-modulatory functions. It is produced in the skin after exposure to sunshine. Recently, many diseases have been associated with Vitamin D deficiency (VDD) in the literature.[6-9]

In previous studies, Al-Amiri *et al*. in their survey identified a gap in knowledge and practice among primary health care physicians. The confusion could be partly attributed to different guidelines and sources of information.[10]

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In this context, a study in the UK found that 86% of respondents had correctly identified the main source of Vitamin D, while only 78% identified Vitamin D as being necessary for bone health and/or calcium absorption.[11]

Another study in Australia indicated confusing and insufficient knowledge in this respect despite their active practice.[12]

Furthermore, a literature review showed that primary care professionals' knowledge, skills and attitude affect the delivery of primary prevention and health promotion among patients.[13]

Safdar and Baajlan conducted a study in Jeddah, KSA, they highlighted the lack of knowledge regarding VDD among health-care professional students and health-care workers in Jeddah, Saudi Arabia.[14] N Costa-Fernandes, A Adodra and *et al*. concluded that primary and secondary HCP in Northwest London had good knowledge of VDD, identified high-risk groups as well as signs and symptoms.[15]

Justification of the study

VDD has reached an epidemic in both developed and developing countries. Literature review showed that population knowledge, attitude, and practice concerning Vitamin D was poor while prescribing doctors and pharmacist are an important source of health information. Hence, their knowledge and practices about Vitamin D is essential for their roles.

General objectives

To assess general knowledge, nutritional knowledge, and attitude regarding Vitamin D among community pharmacists and prescribing doctors in Khartoum Locality, Sudan, 2020.

Materials and Methods

An observational cross-sectional study was carried out from February to April 2020 among 94 community pharmacists and 106 prescribing doctors in Khartoum locality selected by a stratified random sampling technique using electronic delivery validated electronic four sections questionnaire. Data were then analyzed using the Statistical Package for Social Sciences (SPSS) version 15 (IBM SPSSInc., Chicago, IL).

Results

Respondents' characteristics

Of the 200 who responded to the questionnaire, 50% were female and 50% were male. About 78.5% from them were practicing <5 years, while 13.5% were practicing 5–10 years while 8% were practicing >10 years. About 38% from the health professional were pharmacists working in pharmacies, 37% were working in hospitals, while 25% were working in clinics. About 53% from the health professionals in the study were prescribing doctors, while 47% were pharmacists, as shown in Figure 1.

General knowledge score of the study

Of all the participants, 63% showed good general knowledge regarding VDD, as presented in Table 1.

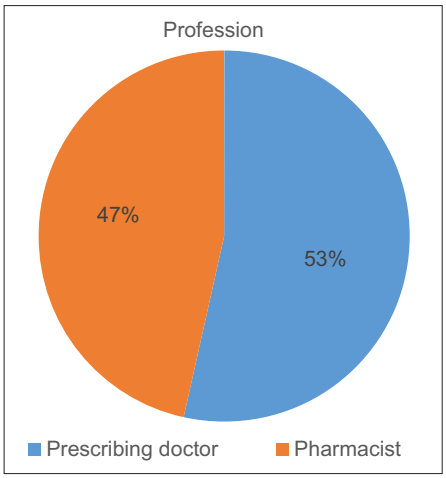

Figure 1: Represent the percent between prescribing doctors and pharmacists in the study

Table 1: General knowledge score of all health professional in the study

Scores	Poor (%)	Good (%)
General knowledge score	37	63

Comparing the knowledge of each health professional, either prescribing doctors or pharmacists, 67.3% from prescribing doctors in the study showed good general knowledge about VDD, while 32.7% had poor general knowledge. About 58.1% from pharmacists in the study showed good general knowledge about VDD, while 41.9% had poor general knowledge as presented in Table 2.

There was a significant trend was found regarding level of knowledge and year of experience ($P = 0.022$) of al health professionals (pharmacists and doctors) in the study, a significant trend found also regarding level of knowledge and work of experience for prescribing doctors ($P = 0.048$) using Pearson Chi-square test P value.

In the questions regarding general knowledge only 22% from health professional in the study stated that vitamin deficiency is not important health issue in Sudan, also 22% stated that Vitamin D intake more than dietary recommendation could not be harmful, 26.5% did not know Vitamin D supplement intake requirement, differ in various seasons of the year and 21.5% stated that inappropriate dietary intake are not related to VDD, 23.5% from all profession in the study did not know that bone pain and fatigue are among the VDD symptoms and 21% from health professionals did not know that most of the vitamin required is produced when the skin is directly exposed to the sun as stated in Table 3.

Nutritional knowledge of Vitamin D

Of all the respondents to the questionnaire, 58.5% showed good nutrition knowledge about Vitamin D, as presented in Table 4. Comparing the profession of the health-care providers in the area of nutrition knowledge prescribing doctors 39.3% and 44.1% from pharmacist's had poor nutrition score toward Vitamin D.

Table 2: General knowledge score of the different profession in the study

Variables	General knowledge score	
	Poor (%)	Good (%)
Profession		
Prescribing doctors	32.70	67.30
Pharmacists	41.90	58.10

Table 3: The general knowledge about the Vitamin D deficiency of health professional in the study

General knowledge	Yes (%)	No (%)	Don't know (%)
People, who indoor, are at high risk of Vitamin D deficiency	74.5	11	14.5
Vitamin D intake more than dietary recommendation could be harmful	60	22	18
Elderly people are at high risk of Vitamin D deficiency	80.5	8.5	11
Inappropriate dietary intake are related to Vitamin D deficiency	65	21.5	13.5
Vitamin D supplement intake requirement, differ for different age groups	80	8.5	11.5
Pregnant and lactating women are at high risk of Vitamin D deficiency	68	15.5	16.5
Most of the vitamin required is produced when the skin is directly exposed to the sun	79	11.5	9.5
Currently, vitamin deficiency is one of the most important health issue in our country	65	22	13
Bone pain and fatigue are among the Vitamin D deficiency symptoms	81.5	5	13.5
Both men and women are at risk of Vitamin D deficiency	76.5	14.5	9
Vitamin D supplement intake requirement, differ in various seasons of the year	56	17.5	26.5

There was a significant trend regarding nutrition knowledge score and different gender groups ($P = 0.02$) of al health professionals in the study using the Pearson Chi-square test *P* value.

Participant's attitude

About 51.5% from respondents had a good attitude score toward Vitamin D. Comparing the profession of the health-care providers in the area of attitude, almost half of prescribing doctors (49.5%) and 47.5% from pharmacists had poor attitude score toward Vitamin D, as presented in Table 5.

There was a significant trend regarding nutrition knowledge score and attitude score ($P = 0.037$) of all health professionals in the study using the Pearson Chi-square test *P* value. This put emphasis on improving nutrition knowledge as it goes along with a positive attitude.

Discussion

General knowledge about Vitamin D deficiency

Of all the participants, 63% showed good general knowledge about VDD compared to study conducted by Ahmed K. Ibrahim, Fahad El-Amri and *et al*. in KSA[10] which showed that 51.3% good knowledge regarding Vitamin D, while 48.7% from primary care physician's showed poor knowledge.

Table 4: Nutrition knowledge of Vitamin D of health professional in the study

Scores	Poor (%)	Good (%)
Nutrition knowledge score	41.5	58.5

Table 5: Attitude score of Vitamin D of health professional in the study

Scores	Poor (%)	Good (%)
Attitude score	48.5	51.5

When comparing each profession participated in our study there was a gap in the knowledge of prescribing doctors and pharmacists (67.3% from prescribing doctors showed good general knowledge about VDD, 32.7% had poor general knowledge while 58.1% from pharmacists showed good general knowledge about VDD, while 41.9% had poor general knowledge), this was parallel to another study in Australia, which assessed general practitioners' knowledge, attitude and practice about Vitamin D, indicated confusing and insufficient knowledge in this respect despite their active practice.[12]

In this study, significant trend was found regarding the level of knowledge and year of experience ($P = 0.022$) of all health professionals (pharmacists and doctors) and a significant trend found also regarding the level of knowledge and work of experience for prescribing doctors ($P = 0.048$) this not found in pharmacists using Pearson Chi-square test *P* value.

Regarding questions of general knowledge only 22% from health professional in the study stated that VDD is not important health issue in Sudan, 22% stated that Vitamin D intake more than dietary recommendation could not be harmful, 26.5% did not know Vitamin D supplement intake requirement differ in various seasons of the year and 21.5% stated that inappropriate dietary intake are not related to VDD.

Twenty-three and five percent from all profession in the study did not know that bone pain and fatigue are among the VDD symptoms, while 76.5% from all health professionals in the study stated that bone pain and fatigue were symptoms of VDD, this was parallel to Al-Amiri *et al*. which stated that fatigue as a symptom for VDD was shown to alert more male than female physician's participants (75.4% vs. 58.4%, $P = 0.026$)[10] and in this context, a study in the UK found that only 78% identified Vitamin D as being necessary for bone health and/or calcium absorption.[11]

In our study, 21% from health professionals did not know that most of the vitamin required is produced when the skin is directly exposed to the sun.

Nutrition knowledge about Vitamin D

In this area, 58.5% from participants showed good nutrition knowledge about Vitamin D. When comparing the profession of the health-care providers in this area, prescribing doctors and pharmacists had 39.3% and 44.1% of poor nutrition knowledge score toward Vitamin D, respectively, which is parallel to Costa-Fernandes and Adodra study in health care professional concluded that education is required about the role of diet in VDD and the eligibility criteria for healthy start vitamins.[15]

There was a significant trend regarding nutrition knowledge scores and different gender groups (P = 0.02) of all health professionals in the study.

Attitude toward Vitamin D

In the area of attitude toward Vitamin D, 51.5% from all health professionals had a good attitude score toward Vitamin D, when comparing the profession of the health -care providers in the area of attitude almost half of prescribing doctors (49.5%) and 47.5% from pharmacist's had poor attitude score toward Vitamin D as concluded by Fahad El-Amri *et al*.[10] in their study that 55.1% had a positive attitude.

In this study, there was a significant trend regarding nutrition knowledge score and attitude score (P = 0.037) of all health professionals in the study using Pearson Chi-square test P value, this put emphasis on improving nutrition knowledge as it goes along with a positive attitude.

Conclusion

This survey identified a gap in the general knowledge, nutrition knowledge and attitude among health-care professionals (prescribing doctors and pharmacists).

Thirty-two and seven percent and 41.9% from prescribing doctors and pharmacists had poor general knowledge, respectively, about VDD while significant trend was found regarding the level of knowledge and year of experience (P = 0.022) of al health professionals (pharmacists and doctors) in the study. 21% from health professionals in the study did not know that most of the vitamin required is produced when the skin is directly exposed to the sun.

39.3% and 44.1% from prescribing doctors and pharmacists, respectively, had poor nutrition knowledge scores toward Vitamin D with a significant trend regarding nutrition knowledge score and different gender groups (P = 0.02) of all health professionals in the study.

49.5% and 47.5% from prescribing doctors and pharmacists, respectively, had poor attitude score toward Vitamin D with a significant trend regarding nutrition knowledge score and attitude score (P = 0.037) of all health professionals.

Recommendations

Further studies with a larger sample size are recommended in able to increase the power and generalize findings.

General and nutritional knowledge and attitude practice of health professionals should be re-evaluated.

Study limitations

The small sample size could be an explanation for failing to detect any statistically significant difference between many variables, and this limitation could be due to the small number of participants due to the health situation in Sudan and the whole world the presence of COVID-19.

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Conflicts of interest

There are no conflicts of interest.

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