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A statistical Study on Visitors to the Alwatan Laboratory Regarding Vitamin D Deficiency

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دراسة إحصائية على زوار مختبر الوطن حول نقص فيتامين د

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Abstract:
Vitamin D deficiency is widespread among both gender and in all age groups at increasing rates, and vitamin D deficiency is associated with low blood calcium levels and bone disorders in addition to systemic diseases (heart disease, cancer, etc.).
This study was conducted under the supervision of the Alwatan Medical Clinic Laboratory located in the city of Hun in the municipality of Jafra during the period from 10/2024 to 12/2024. The focus was on the research problem, which is the problem related to vitamin D deficiency in different age groups. The aim was to identify vitamin D deficiency and provide a complete picture of the diagnosis, treatment mechanism, prevention, community awareness, and health awareness.
The data were collected by a questionnaire to determine the percentage of vitamin D in both sexes and different age groups. An analysis was conducted on the samples taken and the results were read. The number of samples collected for different gender was 88 samples. The percentage of women was 77.3% and the percentage of men was 22.7%. The results showed that vitamin D deficiency is a common problem affecting different age groups, and the age groups between 2 and 60 years were the most vulnerable to vitamin deficiency, with the highest percentage being between 20 and 40 years, and the second place was occupied by the ages between 40 and 60 years. The prevalence was especially high among women and young people, which calls for effective health and awareness interventions.

Keywords: Vitamin D, Health Awareness, Age Groups, Prevention and Awareness.

الملخص
تبحث هذه الدراسة في انتشار نقص فيتامين د وآثاره الصحية بين زوار مختبر الوطن في هون، ليبيا، خلال الفترة من أكتوبر إلى ديسمبر 2024. يُعد نقص فيتامين د مشكلة صحية عامة عالمية تُسهم في انخفاض مستويات الكالسيوم، واضطرابات العظام، ومجموعة واسعة من الأمراض الجهازية مثل مشاكل القلب والأوعية الدموية، والسرطان، واختلالات المناعة.
شمل البحث 88 مشاركًا، منهم 77.3% من النساء و22.7% من الرجال. كشفت النتائج أن نقص فيتامين د شائع في جميع الفئات العمرية، حيث لوحظت أعلى المعدلات لدى الأفراد الذين تتراوح أعمارهم بين 20 و40 عامًا، يليهم أولئك الذين تتراوح أعمارهم بين 40 و60 عامًا. كانت النساء والشباب أكثر عرضة للخطر.
تُسلط الدراسة الضوء على العديد من العوامل المساهمة، بما في ذلك عدم التعرض الكافي لأشعة الشمس، وسوء التغذية، والأمراض المزمنة، والشيخوخة. كما تُشدد على أهمية الفحص المبكر، والاستراتيجيات الوقائية، وحملات التوعية الصحية العامة. وتشمل التوصيات تعزيز التغذية المتوازنة، ومكملات فيتامين د، والتعرض الآمن لأشعة الشمس، ومبادرات التثقيف الصحي الأقوى. ومن خلال توفير البيانات المحلية حول نقص فيتامين د، تؤكد الدراسة على الحاجة الملحة للتدخلات المجتمعية للحد من انتشاره والمخاطر الصحية المرتبطة به، وبالتالي تحسين نتائج الصحة العامة بشكل عام.

الكلمات المفتاحية: فيتامين د, الوعي الصحي, الفئات العمرية, والوقاية والتوعية.

Introduction

Vitamin D is an essential nutrient for bone and immune health, and its deficiency is one of the most common health problems worldwide. Vitamin D deficiency leads to multiple health problems that affect quality of life and increase the risk of chronic diseases. Vitamin D was discovered in the early 20th century. Initially, widespread complaints of diseases such as rickets in children and osteomalacia in adults prompted scientists to investigate the cause. From there, the role of vitamin D in preventing these diseases was identified.

The first discovery was made in 1920, when it was discovered that exposing the skin to sunlight helps prevent rickets, but the actual cause was unknown at the time. In 1922, scientists discovered that a specific substance called vitamin D was responsible for this effect.

Research and Development: In 1928, it was discovered that vitamin D can be synthesized from cholesterol in the skin when exposed to sunlight. Later, two main types of vitamin D were identified: vitamin D2 (ergocalciferol), found in plant sources, and vitamin D3 (cholecalciferol), found in animal sources and also synthesized in the skin when exposed to sunlight.

Recent Developments: In recent decades, scientists have begun to discover more about the other health benefits of vitamin D, including its role in strengthening the immune system, preventing heart disease, supporting bone and joint health, and its impact on some chronic conditions such as diabetes and depression. Vitamin D is an essential vitamin that plays a vital role in many bodily functions, such as regulating calcium and phosphate levels, promoting bone and joint health, and supporting the immune system. Despite the importance of this vitamin, many people, especially the elderly, suffer from vitamin D deficiency, which can lead to a range of health problems such as osteoporosis, increased risk of fractures, a weakened immune system, and heart disease. Vitamin D is a fat-soluble hormone that is essential for maintaining healthy bones and muscles by promoting the absorption and metabolism of calcium and phosphate [13]. Recent studies indicate that vitamin D deficiency has become a common health problem in many parts of the world, including communities with cold climates or those that rely on a diet low in this vitamin. While the primary cause of vitamin D deficiency is insufficient sunlight, other factors such as an unbalanced diet, chronic diseases, and aging may also contribute.

This study seeks to explore the causes of vitamin D deficiency in adults, its impact on their health, and available methods for prevention and treatment. By examining recent scientific evidence, this study hopes to highlight the importance of early vitamin D screening and treatment methods to improve the quality of life for individuals suffering from this problem:

1. Analyze the various factors that contribute to vitamin D deficiency in adults, such as lack of exposure to sunlight, an unbalanced diet, chronic diseases, and genetic factors.
2. Explore the symptoms and complications resulting from vitamin D deficiency, such as osteoporosis, muscle weakness, immune disorders, and an increased risk of chronic diseases.
3. Examine how aging affects the body's ability to absorb and store vitamin D, especially in the elderly.
4. Study various treatment options, such as nutritional supplements, dietary changes, and sun exposure, and how to incorporate them into daily life to improve vitamin levels.
5. Highlight the importance of screening and early diagnosis of vitamin D deficiency: Discuss the importance of early diagnosis and medical tests to determine vitamin D levels in the body, and how to take timely preventive measures.
6. Study the effects of lifestyle, geographic location, and social conditions on vitamin D levels.
7. Based on the research findings, provide practical recommendations for individuals and healthcare organizations to improve vitamin D levels and prevent the negative effects associated with deficiency.

A. Study Problem

The main problem of this Study is to identify the causes of vitamin D deficiency in adults, evaluate its impact on their physical and psychological health, and propose appropriate solutions to mitigate this problem, whether through lifestyle modifications or appropriate medical treatment.

B. Study Significance

This study is of great importance in the field of public health, as it aims to shed light on the problem of vitamin D deficiency, which directly affects the health of adults. Vitamin D is an essential element for maintaining vital bodily functions, including bone health, strengthening the immune system, and improving mental health.

By examining the causes and effects associated with vitamin D deficiency, the study provides comprehensive insights into prevention and treatment methods, enabling healthcare institutions to take effective steps to mitigate this problem. Additionally, the study helps raise community awareness about the importance of vitamin D, contributing to improving public health and reducing the health and economic burdens resulting from its deficiency.

Previous Studies

CHICAGO (Reuters) - Adults with vitamin D deficiency are more likely to die than those with high levels, U.S. researchers said on Monday, further indicating this nutrient's vital role in preventing diseases such as inflammation, appendicitis, heart disease, and even cancer [9, 10, 11]. The researchers' report follows several recent studies that have shown vitamin D may protect against diseases including heart disease, colon and breast cancers, diabetes, and tuberculosis [4, 13, and 14].

The researchers reported in the journal Archives of Internal Medicine that those with the lowest levels of vitamin D were found to have a 26 percent higher risk of death over eight years compared to those with the highest levels [1, 2, and 17]. It's not clear how vitamin D works at the molecular level, but it can improve bone health by aiding calcium absorption. Receptors for this vitamin are found on pancreatic cells that secrete insulin. Dr. Erin Michos and her colleagues studied 13,331 adults for an average of 8.7 years. Of the 1,806 people who died, 777 died from heart disease. Vitamin D deficiency was also associated with an increased risk of death from cancer, diabetes, and other diseases. "We believe we have more evidence to consider adding vitamin D deficiency as a significant risk factor for death, separate from cardiovascular disease, alongside other better-understood factors such as age, gender, family history, smoking, high cholesterol, high blood pressure, lack of exercise, obesity, and diabetes [21]," Mikus said in a statement.

Vitamin D is produced by the body when the skin is exposed to sunlight, and it is also found in fatty fish such as salmon. However, many people get too little of this vitamin, especially in winter. Vitamin D is added to milk and other foods in many countries [1, 22].

A study examined and evaluated the relationship between socioeconomic status, Body Mass Index (BMI), and blood vitamin D levels in obese Egyptians. Blood vitamin D3 levels were measured for 217 Egyptian adults aged 19–50 years by sex, and demographic and socioeconomic data, height, and body weight were taken, and BMI was calculated. For each person, the results showed that 63.5% of the study's 138 subjects suffered from vitamin D deficiency, with the largest percentage of those suffering from vitamin D deficiency being women (82.6%). It was found that (83.3%) of those suffering from vitamin D deficiency were married, and it was found that (44.9%) of them had received education for more than 12 years. It was also found that more than half of the participants (56.5%) held technical, professional, administrative, leadership, technical, or senior professional positions. It was also found that people with vitamin D deficiency in the blood were younger than their counterparts with normal vitamin D levels. It was also found that people with vitamin D deficiency in the blood had the highest average body mass index. It was found that vitamin D deficiency in the blood, higher education, and job level are indicators of a high body mass index [8].

Results and discussion

Table 1: Percentage of Vitamin D Deficiency Cases by Gender.

Gender	Number of cases	Ratio
male	20	22.7%
female	68	77.3%

Table 2: Number of Cases for Different Age Groups.

Age (year)	2 to 20	21 to 40	41 to 60	61 to 80	81 to 90
Number of cases	7	28	42	7	4

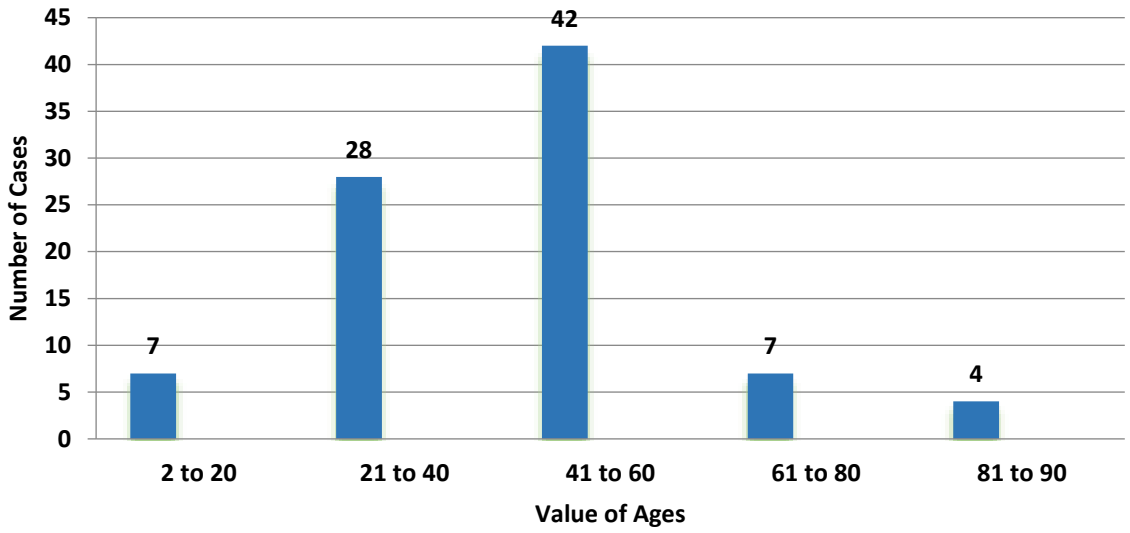

Figure 1: Distribution of vitamin D deficiency cases by age group.

Figure 1 reflects the gender gap in vitamin D deficiency, which can help highlight the most vulnerable groups and address their associated causes. The figure shows that the study focused on analyzing vitamin D deficiency based on age and gender distribution only, with the primary objective of providing an overview of the groups most affected by deficiency. The sample size was 88 cases (with a wide age distribution from 2 to 90 years). Women constituted the largest proportion of those affected (77.3%), with the most affected age group being 20–40 years.

This makes the study's findings more clearly in demonstrating the impact on women. Previous studies agree that vitamin D deficiency among women may be due to lack of sun exposure, hormonal changes, or dietary habits.

As for the age group most affected, the current study showed that the deficiency is concentrated among people between the ages of 20 and 40, while previous studies noted that younger people within the studied group (19-50 years) are most susceptible to infection. This indicates that vitamin D deficiency is a common problem among young people and adults, which calls for highlighting them in health awareness campaigns.

In terms of influencing factors, the current study ignored influences such as education or marital status, while the previous study clearly addressed these aspects. It linked vitamin D deficiency to marriage, showing that 83.3% of those affected were married. It also showed that 44.9% of those affected had higher education, and that 56.5% of them held professional or administrative positions. This in-depth analysis allows the previous study to provide a broader explanation of the influence of socioeconomic factors on the prevalence of vitamin D deficiency.

The current study did not address the relationship between vitamin D deficiency and obesity, while previous studies have demonstrated a close association between the two, confirming that a high body mass index increases the likelihood of vitamin D deficiency. This finding opens the door for further research into the use of vitamin D supplements as a means of reducing obesity.

Regarding recommendations, the current study focused on raising health awareness about the importance of vitamin D and promoting regular screenings for early detection of deficiency, while the previous study called for interventional research to examine the effect of vitamin D supplements on obesity. These recommendations make previous studies more practical and strategic, as they suggest workable solutions based on their findings.

Conclusion

The results of this study confirm that vitamin D deficiency is a widespread problem affecting all age groups, with women and young people at greatest risk. The high prevalence rates point to the urgent need for specific public health strategies, including early screening, nutritional supplementation, and awareness programs. Lifestyle modifications, such as safe sun exposure and a balanced diet, should be encouraged to improve vitamin D levels and reduce associated health complications. This research provides valuable insights for healthcare providers and policymakers in designing effective interventions. Ultimately, addressing vitamin D deficiency will contribute to promoting community health, reducing disease risks, and improving quality of life.

Recommendation

- Routine Screening: Implement regular vitamin D level testing, especially for women and individuals between the ages of 20–60, who are shown to be at higher risk.
- Public Health Campaigns: Increase awareness about the importance of vitamin D through educational programs, community workshops, and media campaigns.
- Nutritional Interventions: Encourage the consumption of vitamin D-rich foods such as fatty fish, fortified dairy products, and eggs, in addition to supplements when necessary.
- Safe Sun Exposure: Promote guidelines for safe exposure to sunlight as a natural and effective method to boost vitamin D levels.
- Healthcare Training: Equip healthcare professionals with the knowledge and tools to identify, diagnose, and manage vitamin D deficiency effectively.
- Targeted Support for Women and Youth: Develop specialized programs that focus on groups with higher prevalence rates to minimize health risks.
- Further Research: Conduct larger-scale studies across different regions to gain a broader understanding of the prevalence and risk factors of vitamin D deficiency in Libya and beyond.

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