

ROLE OF VITAMIN D ON YOUNG ADULTS AND ATHLETES BELONGING TO THE AGE GROUP OF 18-25 YEARS

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ABSTRACT

Vitamin D is considered to be the biggest perpetrator of calcium regulation and promote effective bone health and development. The current research is based on assessing the impact of Vitamin D intake within a specified group of individuals between the age selected age ranges of 18-25 years. Based on literary explanations and substantiated by empirical findings, the study projects an organized understanding of the concept, studied from both scientific and non-scientific perspectives. A few recommendations are suggested in the end to render a complete profile to the subject analysis.

Key words: ROLE OF VITAMIN D ON YOUNG ADULTS AND ATHLETES BELONGING TO THE AGE GROUP OF 18-25 YEARS

1 INTRODUCTION

There has been a historical upsurge in generating interests for delving deeper into assessing the inscrutable role of Vitamin D on the human body. Considering Vitamin D deficiency to be a universal health concern, a plethora of researches has been conducted to ideally focus on the subject and find out strategic recommendations to address the deficiency issues. The most appreciated and acknowledged role of Vitamin D is its power to regulate the generation of Calcium in the body and administer a strong relationship between bone strength development and health sustenance (Tønnesen *et al.* 2016). Assessing from wider perspectives of critical researches, it needs to be stated that Vitamin D not only efficiently regulates the bone health conditions but also expands its benefits on protein synthesis, enhancement of immune responses, cell turnover, and regenerations.

These findings have led the researchers to find out the specific consequences of Vitamin D that boost up with special reference to athletic bodies. Indubitably athletes need to take appropriate care of their bodies and intake the right amount of protein, vitamins, and nutrients to ensure effective regulation of body metabolism. However, Vitamin D not only affects the athletes but is equally important for non-athletic bodies to defend against unexpected health

conditions and diseases. According to the reports procured from the World Health Organisation, it has been found that 77% of the global population suffers from deficiencies of Vitamin D, including many athletes to fall within this category (Luthold *et al.* 2017).

It is seen that inherently Vitamin D possesses a significant impact on muscle weakness, calcium growth, pain management, and imbalances. The aging population is said to suffer from muscular diseases more often than younger adults. Therefore, it is needful to check on the intake of Vitamin D to ensure a more secure and healthy future for the older generation. As it has been established, Vitamin D plays a vital role in maintaining adequacy in serum calcium and phosphorus levels. Medical science has proved that abstinence from Vitamin D leads to absorption of only 15% of dietary calcium and 60% of phosphorus (Lima *et al.* 2016).

Therefore, the consumption of proper Vitamin D intake helps in forming strong bones that are equally important for athletes and non-athletes. This paper aspires to find relevant discourses, providing information on the intake of Vitamin D and its subsequent impact on the health conditions and metabolism rates. The study is said to be procured from categorically assessing a young adult group with the age range of 18-25, to derive at a pertinent conclusion on the impact of Vitamin D on both athletes and non-athletes.

Additionally, the relevant literary sources have been taken into account to conduct the study and reach valuable

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conclusions. Further, the journal article is substantiated by a structured trajectory of assessing the subject in the most appreciable manner by examining the quintessential aspects of Vitamin D intake, accentuating its bearing on the health conditions of the selected age group.

2 OBJECTIVES

- To find out the role of Vitamin D on human body metabolism
- To recognize the challenges of Vitamin D deficiency
- To assess the impact of Vitamin D in ameliorating performances and health conditions
- To provide recommendations on the proper intake of Vitamin D

3 LITERATURE REVIEW AND DISCUSSION

The literature review section is developed, procuring data from an array of academic sources, supported by an analysis of established findings from the medical research field. Based on the empirical annotations, the current section aspires to develop a compact and relevant interpretation of the core subject matter by drawing upon similarities of assessment. The recognition of the fundamental variables of the study leads to the formation of an organized assessment of the subject along with potential implications of deficient intake of Vitamin D, causing disorders to the metabolism function in the human body.

Role of Vitamin D on body metabolism

A scientific definition of Vitamin D would relate to its composition of being an organic compound that is a necessary component required for bone and body health. The human requirements of the body lie in its assessment of the impact on the rate of metabolism, sufficing the components meeting the metabolism needs (Weinert and Silveiro, 2015). The same requirement can be made through the synthesis in the skin through exposure to sunlight. The core functions of Vitamin D are to stimulate intestinal calcium level and to allow the body to conduct optimum phosphorous absorption (Calton *et al.*2015). This specific function of Vitamin D promotes bone calcium mobilization and allows for adequate renal absorption of the calcium in the distal tubule.

As medical science states that intestines play a crucial role in optimizing the metabolism process and thus, proper intake of Vitamin D certainly contributes to supersaturation levels of serum calcium and phosphorus concentrations that are required to prevent the bones from contracting dangerous diseases like rickets, osteomalacia, and hypocalcemic tetany (Nielson *et al.*2016). According to recent experimentation conducted by the National Health Service, it has been palpable that proper intake of Vitamin D plays a vital role in keeping the body energized with sufficient bone health.

The younger individuals along with athletes require adequate Vitamin D intake in order to promote possibilities of Muscle Repair and Remodelling. Additionally, along with the strategies followed to complement the adaptive responses supporting the process of metabolism, nutritional charts are equally followed to enable the individual metabolism process to release proper levels of calcium and phosphorous for bone density and health.

Risks of Vitamin D deficiency on young adults and athletes

The importance of the versatile effect of Vitamin D has become an established phenomenon. Therefore, substantial researches have been conducted to find out the bearing of its deficiency within the purview of body health functioning (Kearns *et al.*2015). According to the researches on the positive impact of Vitamin D intake, it has been found that it plays a decisive role in enhancing the immune functions, abilities to respond to inflammatory urgencies, encourages protein synthesis and muscular functions.

Thus, assessing from a simplified aspect, it can be stated that sufficiency of Vitamin D intake helps in regulating the skeletal muscle and promotes good health among the younger people and athletes. The specific sample taken into consideration for the current study remains to the age group of 18-25 and investigations shows that the maximum impact of Vitamin D deficiency can be seen among this group (Vaughan-Shaw *et al.*2017). Having a lack of Vitamin D intake leads to dire consequences, in the long run, making old age a difficult transitional phase for these individuals. A common symptom of Vitamin D deficiency is muscle weakness, followed by lack of energy and an insufficient compromised immune system. According to the reports covered by Third National Health and Nutrition Examination Survey (NHANES III), it has been noted that Vitamin D insufficiencies can be seen in over 1 million people across the globe (Muschitz *et al.*2016).

There has been as much as 65% of Vitamin D deficiency cases reported over the last thirty years in the UK. The age group specifically belongs to the sampled age range and its eventual conclusions towards seniors specifically. Considering the risks of Vitamin D deficiency among young adults and athletes, it needs to be stated that the lack of sufficient Vitamin D intake can directly affect the immune system. Since Vitamin D is a fat-soluble vitamin, young adults, who carry excess amount body fat, pose a risk of 55% of their vitamin D cells getting confined within the fatty cells (Lykkedegn *et al.*2015). Additionally, one more aspect of Vitamin D deficiency can be seen in the excessive use of sunscreen.

Researches show that the young adults along with the athletes who spend a maximum part of their day out in the sun have a tendency of using sunscreen lotion, sunglasses and helmets to cover from the heat of the sun. This reduces the formation of Vitamin D within the body, leading to a risk of suboptimal vitamin D production. This situation directly affects the body metabolism. As per the research conducted by The Thorne Magazine, it has been found that only a minimal percentage of 5% of athletes are able to meet

up with the recommended intake of Vitamin D (Esmat *et al.*2015). Therefore, it is evident that Vitamin D deficiency can lead to undeniable consequences that affect the body's metabolism and secure functioning of the muscular system.

Further, the growing impacts of Vitamin D deficiency in young adults and athletes can be manifested through possible symptoms of severe levels of upper respiratory tract infections (URTIs). Therefore, it needs to be stated that adequate levels of Vitamin D are required to sustain the normal health of the body and support the standard metabolic rate.

Does Vitamin D sufficiency better health conditions for athletes and young adults?

Aptly known as the "Sunshine Vitamin", Vitamin D production is enhanced with adequate exposure to the sun. Vitamin D, regarded as a secosteroid in medical science acts as a synergist to as many as 2,000 genes involved in the cellular growth, skeletal strength and enhancement of protein synthesis functions (Pincikova *et al.*2017). The active role of Vitamin D lies in optimizing the genomic functions in the blood vessels, enhancing the energy level of the body. Therefore, it can be stated that Vitamin D plays a wide range of functions within the human body, ranging from bone health growth, energy stimulation, muscle function and abilities to increase the immune system.

Corresponding, the discussion, it is needless to state that the role of Vitamin D for a healthy body is an undoubted fact in medical science. Vitamin D with its array of functions certainly affects the energy level and health conditions of the young adults and athletes in a constructive way. The subsequent section will provide a granular analysis of the functions of Vitamin D and its impact on the health conditions of young adults and athletes.

• Promotes healthy bones:

Vitamin D plays a momentous role in the generation and regulation of the calcium level and sustaining the standard rate of phosphorous within the blood. These factors are crucial to maintaining the good health of the body. Scientifically, it has been assessed that proper intake of Vitamin D turns on the expression of genes and augments the intestinal calcium (Legarth *et al.*2018). According to the studies on Vitamin D intake, it has been proved that Vitamin D helps in preventing injured and affected bones. Derived from an empirical assessment, it was found that the risk of bone fractures had been 3.6 times higher among the young adults and athletes with less than 75 nmol/L concentration of Vitamin D.

• Enhances Skeletal Muscle Function:

Deficiency in Vitamin D intake leads to unpredictable musculoskeletal pain and weaknesses. Vitamin D has a non-genomic effect that tends to impact the muscular position of a body by assessing the standard meters of its strength and sustainability (Von Websky *et al.*2018). It has been medically proven that inadequate intake of Vitamin D leads to atrophy of fast-twitch muscle fibers, eventually stimulating the nerve cells, leading to anxiety and stress.

• Boosts energy:

From the above discussion of the points, it is evident that appropriate intake of Vitamin D leads to augmentation in the energy levels. As it provides an array of bearings on human health, Vitamin D is stated to equate all its functions to relate to energy enhancement in human bodies, especially young adults. According to the survey conducted by Newcastle University, it allows the muscles to work competently to boost up the energy levels (Vicicca *et al.*2017). From the scientific perspective, the intake of Vitamin D facilitates enhancement in the activities of mitochondria that are regarded as the batteries of the human body cells.

According to the research by Newcastle University, it has been found that approximately 60% of the residents of UK are deficient to Vitamin D, including a major portion comprising of young adults and a significant portion comprising of children less than 5 years of age (Riche *et al.*2016). The research has been conducted through the use of non-invasive magnetic resonance scans to assess Vitamin D deficiency levels among the selected samples. Further, another research conducted by Tyne Hospitals NHS Foundation Trust stated, that Vitamin D undoubtedly plays the most imperative role in enhancing the energy level of human bodies.

Specifications and Recommendations on Vitamin D intake

From the above discussion, it has been established that the intake of adequate levels of Vitamin D leads to the development of a better health condition by enhancing the functioning of muscular-skeletal cells. Therefore, it is necessitating to consume the recommended Vitamin to ensure good and sustainable health for the future (Shahrokhii *et al.*2016). The nutritional strategies supporting the consumption of Vitamin D showcases on consuming fresh foods including egg yolks, milk, cereal, orange juice, and fatty fishes. While the mentioned dietary sources may appear to highly significant in delivering good health, the process of digestion leads to a contribution of 50% efficiency, as half of the dietary value gets absorbed during the digestion process (Snoddy *et al.* 2016).

According to the recent researches conducted by the NHS and National Institute of Medicine (IOM), there have been new standardized recommendations on the intake of Vitamin D on a regular basis. The calculations are presented as 400–600 IU/day for children & adults between 0–70 years and 800 IU/day for older adults for over 70 years of age (Mazidi *et al.*2017). Thus, it needs to be stated that the selected focus group on whom the current research is conducted needs to intake a regular consumption of dietary intake between 400–600 IU/day. However, there have been debates on the intake of Vitamin D for adults and children as; arguments have shown up against the recommended standards suggested by NHS and the National Institute of Medicine (Chaudhary *et al.*2016).

The argument is raised by the Endocrine Society, suggests that there are needs to have appropriate definitions of Optimal serum 25(OH) D concentrations, assessing upon

the adequate intake of Vitamin D. Consequently, a standard recommendation proposes that considering all the possibilities of Vitamin D deficiency and lack of exposure to sun, would require more intake and its can be advised that an intake of 1000 IU/day in absence of exposure to the sun would be sufficient to sustain the 25(OH)D levels of at least 32 ng/mL for children and adults.

4 CONCLUSION AND RECOMMENDATIONS

The continued plethora of evidence showing the importance of Vitamin D requirements within the body for young adults and athletes have been presenting diverse views on the subject authenticity. The above discussion shows that there are undoubted risk factors that are associated with deficiency of Vitamin D intake and affects the body's metabolism and performances both directly and indirectly. New insights have been developed from the perspective of standard vitamin D intake for adults and young children and adults.

Additionally, the study progresses towards the development of a comprehensive understanding of the management of Vitamin D intake as a part of daily living. The purpose of the review has successfully addressed the core aspect of the subject and collated the recent data generations pertaining to the subject. Some of the clinical recommendations on the intake of Vitamin D for young adults and athletes belonging to the defined age range are stated below:

1. Need to measure the regular intake of Vitamin D 25-Hydroxy levels
2. Recommendation on maximum UV exposure
3. A standard level of 25-Hydroxy Vitamin D of 30ng/ml is considered secured [1–20]

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