The 7th international- 21th Arabic conference for Home Economics "Home Economics and sustainable development2030"
December -15th, 2020

Journal of Home Economics

http://homeEcon.menofia.edu.eg

ISSN 1110-2578

The Relationship Between Vitamin D3Blood Level Socioeconomic Status And Body Mass Index among obese subjects

Hussein, EA.[1] ,AbeerA.Khedr[1],Sahar S. Zaghloul[2], Rehab M. Shoaib[3]
,The Faculty of Home Economics- Menoufia University[1],The National Nutrition Institute[2], Egyptian Ministry of Health[3]

Abstract:

Objective: To examine the relationship between socioeconomic status (SES), body mass index (BMI) and vitamin D level in obese non diabetic, non- hypertensive Egyptian subjects.

Design and Method: Vitamin D3 blood level of 217 Egyptian adults between 19-58 years of age was measured. Anthropometric measurements were taken and socioeconomic information was collected.

Results: 63.5%of participants (n=138) were vitamin D3 deficient (vitamin D3< 20 ng/mL) of which 82.6%were females (n=114), 83.3% were married, 44.9% obtained more than 12 years education. More than half (56.5%) of the participants were either white collars or professionals. Vitamin D3 deficient participants were significantly younger than their counterparts with mean age 34$\pm$ 5.8 and 36$\pm$ 8.5 years and had higher mean BMI 35.5 $\pm$ 5.2, 33.5 $\pm$ 3.3 ($p<0.05$) respectively. Low serum vitamin D3, high education and occupation levels were predictors of high BMI.

Conclusion: Vitamin D3 deficiency is common among Egyptian adults and is associated with high BMI which calls for more intervention research to test if vitamin D3 supplementation could reduce the prevalence of obesity.

Introduction

Obesity, a medical disorder of excessive accumulation of body fat have been associated with increased mortality and causes serious health problems **(Flynn *et al*., 2006, Moyer 2012, Bagheri*et al.*,2018).** Increased by 27.5% between 1980 and 2013 from 921 million adults to 2.1 billion **(Cassity*et al*., 2016).** Obesity is a rapidly growing health problem in most developed countries **(McLaren 2007; Ogden *et al.*, 2007).** Globally, 40% of deaths and 38% of the DALYs related to high BMI occurred among non-obese individuals. While some studies have argued that overweight is associated with lower risk of all cause mortality compared to a normal range of 18-25 kg/m^2 **(Flegal*et al.*, 2013)**.

In 2013, the World Health Organization (WHO) called for zero increase in the prevalence of obesity among adults and zero increase in the prevalence of overweight among children (**McGuire, 2015)**.Given the rising burden of obesity and extreme obesity, health care professionals need to play a more active role in both the promotion of weight loss and controlling the complications of obesity **(Roberto *et. al.*, 2015)**. The highest level of adult obesity observed in Egypt in 2015 was at 34.9% (32.4-37.3%)**(GBD, 2017)**.

Although vitamin D is obtained from exposure to sunlight and from diet, vitamin D deficiency is not uncommon in many regions and the areas at high risk of vitamin D deficiency include South Asia and the Middle East **(Hwalla*et al*., 2017)**. Causes of vitamin D deficiency studied included lack of exposure to sunlight either due to cultural dresses styles or excessive use of sunscreen, or due to institutionalization and altitude **(Cole *et al*., 2012)**. Diet, lifestyle, demographic aspects also play a role. In addition, research showed more obese individuals tend to have lowervitamin D levels **(Cole *et al*., 2012)**.

The prevalence of vitamin D deficiency and insufficiency was found high among women of childbearing age in Egypt where 72% of the 208 women studied were found to be vitamin D insufficient (serum 25(OH)D <50 nmol/L) **(Botros*etal.*,2015)**. Also **El Sagheer*et al*.,(2016)** examined 100 women aged 20-40 years and found them to be vitamin D insufficient and reported that the lack of sun exposure, lack of vitamin D supplementation, and the presence of pseudo-fracture were independent factors associated with vitamin D insufficiency. In addition, **El Tayeb*et***

***al*.,(2013)**randomly tested 59 men, aged 40-59 years, and found 62.7% had desirable serum 25(OH)D ≥75 nmol/L, with 13.6% and 23.7% having inadequate (50-72.5 nmol/L) and insufficient (<50 nmol/L) status, respectively. Low prevalence of vitamin D deficiency has been reported among elderly at 19.3% **(El Rifai*et al*., 2014)** and vitamin D insufficiency was 77.2% **(Aly*et al*., 2014)**. Vitamin D deficiency have been implicated in the development of several metabolic complications including metabolic syndrome and its components factors such as abdominal adiposity, insulin resistance (and beta cell function), hypertension, and atherogenic dyslipidemia **(Bagheri*et al*.,2018)**.

We are not aware of any studies in Egypt that investigated the relationship between obesity and vitamin D deficiency. The current study aims to assess the prevalence of vitamin D deficiency among obese Egyptian adults and determine predictors associated with vitamin D deficiency.

Subjects and method

Subjects:

Participants were recruited from outpatient clinics at the National Nutrition Institute (NNI) in Cairo, Egypt. Out of 400 subjects recruited, 246 obese adults between 19-58 years of age agreed to participate in the clinical trial investigating the effect of vitamin D supplementation on weight reduction. Trial was approved by the Ethics Committee at the General Organization of Teaching Hospital and Institutes and consent forms were obtained from participants. Exclusion criteria included obese subject with diabetes, hypertension, kidney or liver diseases. Participants were screened for vitamin D3 (25-hydroxyvitamin D) deficiency, diabetes, liver and kidney functions. 29 participants were excluded for not meeting inclusion criteria and 217 participants were included in the current study where 138 participants were vitamin D3 deficient and 79 were vitamin D3 sufficient.

Data Collected:

Socioeconomic data including age, gender, education, occupation, marital status, family size were collected using the validated socioeconomic questionnaire developed by **El Gilany*et al.*(2012).** Body height and weight were measured to the nearest 0.1cm and 0.1kg, respectively, while wearing light clothes and barefooted. WHO anthropometric measurement protocol was used. BMI was calculated as weight (kg) divided by the height square in meters **(WHO, 1995)**

Laboratory Analysis:

25-Hydroxy Vitamin D (25(OH) D) serum level was estimated using the EUROIMMUN Enzyme-linked Immune-sorbent Assays (ELISA) test kits for determination of 25 vitamin D. A 25(OH) D level of less than 20 ng per milliliter (ng/mL) or 50 nmol per liter (nmol/L) indicates vitamin D deficiency. Insufficiency of vitamin D is defined as a 25(OH)D level of 21 to 29 ng/mL or 52 to 72 nmol/L **(Holick, 2007)**. A 25(OH)D optimal level begins at 30 ng/mL or 75 nmol/L **(Bischoff-Ferrari *et al*.,2006; Holick, 2007).**For the current studyvitamin D3deficiency was determined as 25 hydroxy Vitamin D **<** 20 ng/mL**.**

Statistical Analyses

Statistical Package for Social Sciences **(SPSS version 21, 2012)** was used. Descriptive statistics included mean, standard deviation and frequencies were performed to compare differences in socio-demographic characteristics between vitamin D deficient and sufficient participants. Linear regression was performed to determine predictors of high BMI (dependent variable). Independent variables included age, gender, marital status, education, occupation and vitamin D serum level.

Results and Discussion:

In this study 79 out of the 217 participants were vitamin D sufficient (36.4%) while 138 were Vitamin D deficient (63.6%). Vitamin D deficiency was found to be prevalent across the Middle East and North Africa **(Green *et al.*, 2015; El Garf*et al.*, 2015 ; Hwalla*et al.*, 2017)**. Characteristics of the population studied are described in Table 1. 82.6% of vitamin D deficient subjects were females although the difference in vitamin D deficiency and/or sufficiency between males and females did not reach statistical significant level. It could be a explained by the unequal number of males and females participants.

The current study revealed that educational attainment and marital status were significantly different between vitamin D sufficient and their deficient counterparts Among vitamin D3 deficient participants 44.9%had compared to 39.2among vitamin D3 sufficient. Moreover vitamin D3 deficiency increased with increase educational attainment where 44.9% of vitamin D3 deficient had more than 12 years education compared with subjects with no education (8%,), less than 12 years (13.0%) and 12 years education (34.1%). 83% of vitamin D deficient participants were married compared with 70.9% among vitamin D sufficient

No statistical significant relationship between gender and vitamin D deficiency was detected. This finding was confirmed by many studies **(Baradaran*et al.*, 2012, Kafeshani*et al.*, 2016 and Khazaei *et al.*, 2017).** Unlikethe current study, **Lagunova*et al*.,(2009)** found a significant decrease in serum 25(OH) D3 among females compared to males. Men had higher rates of vitamin D deficiency than women and about 40% of severely obese women and 75% of men had vitamin D deficiency during the winter and spring and only about 25% of them stayed deficient during the summer. Also **AlJohara*et al*.(2018)** showed not only a high prevalence of vitamin D deficiency (85%, n = 2414) among the adult Saudi population but has also found that younger adult (78% were in the age group of 30 to 50 years) and males (72.0% vs. 64.0%) had a higher prevalence when compared to older and female participants. Moreover, **Johnson *et al.(*2012)** demonstrated that men had higher odds of vitamin D deficiency even after adjustment for the confounders such as season, age, current smoking and vitamin D supplements.

No statistical difference in vitamin D level was detected by occupation in the current study. On the contrary, **Sowah *et al.,(2017)*** found that shift-workers, healthcare workers and indoor workers are at high risk to develop vitamin D deficiency which was explained by a lifestyle that limits sunlight exposure. Similar findings were reported by **Gonzalez *et al.(2007) and van der* Meer *et al.(2011)***. Multiple studies showed that the occupations with minimal or no exposure to sunshine even those in sunny countries, put subjects at a greater risk of developing vitamin D inadequacy ***(*Romano*et al., 2015;* Kwon *et al., 2015;* Roomi *et al., 2015;* Xiang *et al., 2013).***

Table 2 results showed that height and family size were not statistically different between vitamin D sufficient and vitamin D deficient counterparts. However mean BMI was statistically significantly greater for vitamin D deficient subjects compared to vitamin D sufficient counterpart(35.5 $\pm$ 5.2 and 33.5 $\pm$ 3.3 kg/m2, respectively). Also vitamin D sufficient were 1 cm taller than vitamin

D deficient participants with a mean +SD of 165.9 ± 8.9 and 64.9 ± 7.7 cm respectively. Age was significantly different among vitamin D sufficient and vitamin D deficient counterparts(36.0 + 8.5 and34.0 + 5.8 respictivly).Some studies showed a positive correlation between serum vitamin D and age (**Bischoff** ***et a.l,*** **2004; Steingrimsdottir,** ***et al.*** **,2005; Baradaran*et al.*, 2012; Khazaei e*t al.*, 2017).** Unlike**Adami*et al.*, (2008)** who reported no difference between vitamin D deficiency and age.

The current study found that BMI was higher among vitamin D deficient compared with vitamin D sufficient participants. Also **McGill *et al.*,(2008)** revealeda significant inverse relationships of vitamin D3 with BMI (p = 0.005).

Linear regression models showed that predictors of high BMI included serum vitamin D, education level and occupation (Table 3). The β coefficient for serum vitamin D was -0.05 (CI -0.087, -0.006; p=0.03) indicating decreased serum vitamin D with increased BMI. Similarly subject with professional occupation predicted high BMI (β=-0.42, CI -0.727—0.121; p<0.006). On the contrary educational attainment BMI increased with increased education level (β =1.00, CI 0.005-2.008; p<0.05). Similar to the current study, **Chakhtoura*et al.*(2018)** studied vitamin D deficiency in the Middle East and North Africa countries and the risk factors of vitamin D deficiency and found that the significant predictors of low 25(OH)D levels were female gender, increasing age and body mass index, veiling, winter season, use of sun screens, lower socioeconomic status, and higher latitude. Also **Liu *et al.*(2018)** reported that obese adults showed 3·09 times higher prevalence of vitamin D deficiency and 1·80 times higher prevalence of vitamin D insufficiency than non-obese adults among US population. Likewise 25(OH)D concentrations <40 nmol/L were twice likely to be found in the obese compaired to non-obese and in Scottish participants than in those from other parts of Great Britain (ie, England and Wales) (P < 0.0001 for both) **(Hyppönen and Power, 2017)**.

In conclusion, vitamin D deficiency is prevalent in Egypt among obese adults and it may be necessary to reach a desirable 25(OH)D level of 20 ng/ml to combat obesity. Studies are needed to investigate the effect of vitamin D supplementation on weight change and confirm the long term safety.

Table 1: Characteristics of participants (N=217)

Characteristics	Vitamin D sufficient ($\geq$ 20 ng/ml) (N=79) N (%)	Vitamin D deficient (<20 ng/ml) (N=138) N (%)	P-value
Gender			
Males	22 (27.8)	24 (17.4)	0.07
Females	57(72.2)	114 (82.6)	
Education			
No education	11(13.924)	11 (8.0)	**0.23***
< 12 years	2 (2.532)	18 (13.0)	
12 years	35(44.304)	47 (34.1)	
>12 years	31(39.240)	62 (44.9)	
Occupation			
Housewives, unemployed	17(21.5)	40 (29.0)	0.1
Labor	6 (7.5)	20 (14.5)	
White collar	26 (32.9)	29 (21.0)	
Professional	30 (38.0)	49 (35.5)	
Marital status			
Single	23 (29.1)	23 (16.7)	**0.03***
Married	56 (70.9)	115 (83.3)	

p-vaule are significantly different at $p < 0.05$

Table 2: Mean age,Weight,Height, BMI and family size among vitamin D deficient and vitamin D sufficient participants

	Vitamin D sufficient ($\geq$ 20 ng/ml)	Vitamin D deficient (<20 ng/ml)	T-value
Age	$36.0^{a} \pm 8.5$	$34.0^{b} \pm 5.8$	-2.075
Weight (kg)	$92.3^{b} \pm 11.9$	$96.5^{a} \pm 15.7$	2.207
Height (cm)	$165.9_{a} \pm 8.9$	$164.9^{a} \pm 7.7$	-0.801
BMI	$33.5^{b} \pm 3.3$	$35.5^{a} \pm 5.2$	3.296
Family size	$5.0^{a} \pm 1.4$	$4.0^{a} \pm 1.2$	-1.001

Values in the same row and suitable not sharing the same subscript are significantly different at $p < .05$

Table 3: Predictors of body mass index among adult obese participants

Predictors	B-coefficient	P-value
Age	0.1	0.08
Serum Vitamin D	-0.05	0.03*
Education level	1.00	0.05*
Occupation	-0.42	0.006**
Marital Status	1.72	0.08

*p ≤ 0.05 ** p ≤ 0.01

Referances

1. **Adami, S.;Viapiana, O.;Gatti, D.;Idolazzi, L. and Rossini, M.(2008):** Relationship between serum parathyroid hormone, vitamin D sufficiency, age, and calcium intake. Bone.;42:267-70. doi: 10.1016/j.bone.
2. **AlJohara, M.AlQuaiz ; Ambreen Kazi1 ; Mona Foudaand Nada Alyousefi (2018):**Age and gender differences in the prevalence and correlates of vitamin D deficiency : International Osteoporosis Foundation and National Osteoporosis Foundation .
3. **Aly, W.W.; Hussein, M.A.; Moahamed Ebeid, S. and Mortagy, A.K**.(**2014**): Prevalence of vitamin d insufficiency among community dwelling elderly in dakahlia as a representative of rural areas in egypt. *Aging Clin Exp Res*, *26*, 47-51.
4. **McGill, Anne-Thea; Stewart, Joanna M.; Lithander, Fiona E.; Strik, Caroline M. and Poppitt, Sally D. (2008):** Relationships of low serum vitamin D3 with anthropometry and markers of the metabolic syndrome and diabetes in overweight and obesity;Nutrition Journal ; 7:4 doi:10.1186/1475-2891-7-4 .
5. **Bagheri, M. ; Djazayery A. ; Qi, L. ; Yekaninejad, MS. ; Chamari, M. ; Naderi, M.; Ebrahimi, Z.; Koletzko, B. ; Uhl, O. and Farzadfar, F. (2018):** Effectiveness of vitamin D therapy in improving metabolomic biomarkers in obesity phenotypes: Two randomized clinical trials. International Journal of Obesity V.42:1782–1796:
6. **Baradaran, A., Behradmanesh,S.andNasri, H. (2012):**Association of body mass index and serum vitamin D level in healthy Iranian adolescents. Endokrynol Pol;63:29-33.
7. **Bischoff-Ferrari, H., Borchers, M., Gudat, F., Dürmüller, U., Stähelin, H., Dick, W. (2004):**Vitamin D receptor expression in human muscle tissue decreases with age. J Bone Miner Res.;19:265-9.
8. **Bischoff-Ferrari, H.A.; Giovannucci, E.; Willett, W.C.; Dietrich, T.and Dawson-Hughes, B.(2006**): Estimation of optimal serum concentrations of 25-hydroxyvitamin D for multiple health outcomes. Am J Clin Nutr.;84:18–28.

9. **Botros, R.M.; Sabry, I.M.; Abdelbaky, R.S.; Eid, Y.M.; Nasr, M.S. and Hendawy, L.M. (2015):**Vitamin d deficiency among healthy egyptian females. *Endocrinologia y nutricion : organo de la Sociedad Espanola de Endocrinologia y Nutricion*, *62*, 314-321.
10. **Cassity, E.P.; Redzic, M.; Teager, C.R. and Thomas, D.T.(2016):**The effect of body composition and BMI on 25(OH)D response in vitamin D supplemented. Eur J Sport Sci; 16:773–9.
11. **Chakhtoura,M.;Rahme,M.; Chamoun,N.and El-Hajj,Fuleihan, G**.(2018): Vitamin D in the Middle East and North Africa. Bone Rep. 2018 Mar 17;8:135-14.
12. **Cole, Z.A.; Harvey, N.C.; Cooper, C. ; and Edwards, M.H. (2012):**The global epidomology of vitamin D status ; JARCP The Journal of Aging Research & Clinical Practice .
13. **El Garf, K.; Marzouk, H.; Farag,Y.; Rasheed, L.and El Garf,A. (2015):**Vitamin D status in Egyptian patients with juvenile onset systemic lupus erythematosus; Rheumatol Int 35:1535–1540 DOI 10.1007/s00296-015-3245-x.
14. **El Gilany, A.; El-Wehady, A. and El-Wasify, M. (2012):** Updating and validation of the socioeconomic status scale for health research in Egypt. EMHJ, 18 (9).
15. **El Rifai, N.M.; Abdel Moety, G.A.; Gaafar, H.M. andHamed, D.A**. **(2014)**:Vitamin d deficiency in egyptian mothers and their neonates and possible related factors. *J Matern Fetal Neonatal Med*, *27*, 1064-1068.
16. **El Tayeb, I.M.; El-Saghier, E.O.A.; Cheta, S.; Sabbah, N.A.andRaafat, N.(2013):**Assessment of vitamin d status among senior executive managers in large scale industries in the 10th of ramadan city, egypt. IOSR Journal of Dental and Medical Sciences, 12, 77-83.
17. **El-Sagheer, G.M.; Soliman, E.; Abdulla, A.M. and Ali, M. (2016**):Vitamin d deficiency and pseudofractures in child-bearing egyptian women: Successful medical treatment helps to avoid fractures and surgical interference. Journal of Endocrine and Metabolic Diseases, 6, 183-191.

18. **Flegal,KM.,;Kit, BK.,;Orpana, H., and Graubard B. (2013):** Association of All-Cause Mortality with Overweight and Obesity Using Standard Body Mass Index Categories: A Systematic Review and Meta-analysis. JAMA.: 309(1): 71–82. doi:10.1001
19. **Flynn,M.A.; McNeil, D.A.; Maloff, B.; Mutasingwa, D.; Wu, M.; Ford,C. and Tough, S.C. (2006**):Reducing obesity and related chronic disease risk in children and youth: a synthesis of evidence with 'best practice' recommendations. Obes Rev. 7 Suppl 1:7-66.
20. **GBD, 2015 Obesity Collaboration** (2017): Health effects of overweight and obesity in 195 countries over 25 years**.** N Engl J Med, 377 (2017), pp. 13-27
21. **Gonzalez, G.; Alvarado, J.N.; Rojas, A., Navarrete, C., Velasquez, C.G. andArteaga, E., 2007:** High prevalence of vitamin D deficiency in Chilean healthy postmenopausal women with normal sun exposure: additional evidence for a worldwide concern. Menopause;14(3 Pt 1):455–61.
22. **Green, R. J.;Samy, G. andMiqdady, M. S.(2015);** Vitamin D deficiency and insufficiency in Africa and the Middle East, despite year-round sunny days: July 2015, Vol. 105, No. 7.
23. **Holick, M.F. (2007):** Vitamin D Deficiency; . N Engl J Med.;357:266–81.
24. **Hwalla, N.; Al Dhaheri, A.S. ; Radwan, H. ; Alfawaz, H.A. ; Fouda, M.A.; Al-Daghri, N.M. ; Zaghloul, S.and Blumberg, J.B. (2017):** The Prevalence of Micronutrient Deficiencies and Inadequacies in the Middle East and Approaches to Interventions; Nutrients, 9, 229; doi:10.3390/nu9030229.
25. **Hyppönen, E. and Power, C. (2007)**: Hypovitaminosis D in British adults at age 45 y: nationwide cohort study of dietary and lifestyle predictors.Am J ClinNutr. 2007 Mar;85(3):860-8.
26. **Johnson, V.;Hofsø, V.;Aasheim, V.;Tanbo, V.; Holven, V. Andersen, V.;Røislien, V.andHjelmesæth, V. (2012) :**Impact of gender on vitamin D deficiency in morbidly obese patients; a cross-sectional study: European Journal of Clinical Nutrition n 66, 83–90

27. **Kafeshani, M.;Zarafshani, M.;Shokri-Moghaddam, S.; Ahmadi, A. andNasri, H.(2016):**Serum 25-hydroxy vitamin D level in diabetic patients versus normal individuals; a pilot study. J Parathyr Dis.;4:40-43.
28. **Khazaei, Z. ;Khazaei, S.;Beigrezaei, S. andNasri, H. (2017)** :Vitamin D deficiency in healthy people and its relationship with gender and age : Journal of Parathyroid Disease 2018,6(1),16–18
29. **Kwon, S.I.; Son, J.S.; Kim, Y.O.;Chae, C.H.; Kim, J.H. and Kim, C.W. (2015):**Association between serum vitamin D and depressive symptoms among female workers in the manufacturing industry. Ann Occup Environ Med. 2015;27:28.
30. **Lagunova, Z.;Porojnicu, A.C.; Lindberg, F.;Hexeberg, S. and Moan, J. (2009)**: The Dependency of Vitamin D Status on Body Mass Index, Gender, Age and Season: ANTICANCER RESEARCH 29: 3713-3720.
31. **Liu, X.; Baylin,A.and Levy, P.D.(2018)**: Vitamin D deficiency and insufficiency among US adults: prevalence, predictors and clinical implications. Br J Nutr. 2018 Apr;119(8):928-936
32. **McGuire, S. (2015):** World Health Organization. Comprehensive Implementation Plan on Maternal, Infant, and Young Child Nutrition. Geneva, Switzerland, 2014. *Advances in nutrition (Bethesda, Md.)*, *6*(1), 134–135. doi:10.3945/an.114.007781.
33. **McLaren, L. (2007):** Socioeconomic status and obesity; Epidemiol Rev 29: 29-48**.**
34. **Moyer,V.A.(2012)** : US Preventive Services Task ForceScreening for and management of obesity in adults: US Preventive Services Task Force recommendation statement Annals of Internal Medicine, 157 pp. 373-378
35. **Ogden, C.L.;Yanovski, S.Z.; Carroll, M.D. and Flegal, K.M. (2007)**:The epidemiology of obesity. Gastroenterology 132: 2087-2102.
36. **Roberto, C.A.; Swinburn, B.; Hawkes, C.; Huang, T.T.; Ashe, M.;Zwicker, L.;Cawley, J.H.and Brownell, K.D. (2015):** Patchy progress on obesity prevention: emerging examples, entrenched barriers, and new thinking. Lancet: (385): 9985; 2400-2409.

37. **Romano, A.;Vigna, L.;Belluigi, V.; Conti, D.M.;Barberi, C.E.;Tomaino, L.(2015):** Shift work and serum 25-OH vitamin D status among factory workers in Northern Italy: Cross-sectional study. ChronobiolInt; 32(6):842–7.
38. **Roomi, M.A.;Farooq, A.;Ullah, E. and Lone, K.P. (2015):**Hypovitaminosis D and its association with lifestyle factors. Pak J Med Sci.; 31(5):1236–40.
39. **Sowah, D. ; Fan, X. ; Dennett, L. ;Hagtvedt, V.andStraube, S. (2017):**Vitamin D levels and deficiency with different occupations: a systematic review;. BMC Public Health (2017) 17:519; DOI 10.1186/s12889-017-4436-z.
40. **(SPSS version 21, 2012)**
41. **Steingrimsdottir, L.; Gunnarsson, O.; Indridason, O.S.; Franzson, L.and Sigurdsson, G. (2005)** :Relationship between serum parathyroid hormone levels, vitamin D sufficiency, and calcium intake. JAMA;294:2336-2341.
42. **vander, Meer, I.M.;Middelkoop, B.J.;Boeke, A.J.; Lips, P.(2011):** Prevalence of vitamin D deficiency among Turkish, Moroccan, Indian and sub-Sahara African populations in Europe and their countries of origin: an overview. Osteoporos Int.;22(4):1009–21.
43. **World Health Organization (1995)**: Physical status: the use and interpretation of anthropometry Report ofan Expert Committee,Geneva.http://www.who.int/iris/handle/10665/37003.
44. **Xiang, F.; Jiang. J.; Li, H.; Yuan, J.; Yang, R.;and Wang, Q.(2013)**: High prevalence of vitamin D insufficiency in pregnant women working indoors and residing in Guiyang, China. J Endocrinol Invest.;36(7):503–7.

Journal of Home Economics

المؤتمر الدولى السابع- العربى الحادى والعشرون للإقتصاد المنزلى
" الإقتصاد المنزلى والتنمية المستدامة 2030 "
15 ديسمبر 2020 م

http://homeEcon.menofia.edu.eg ISSN 1110-2578

دراسة العلاقه بين مستوي فيتامين د في الدم والحاله الاجتماعية والاقتصادية ومعدل كتلة الجسم لأشخاص بدناء

عصام عبدالحافظ حسين[1]، عبير أحمد خضر[1]،سحر سعد زغلول[2]، رحاب محمد شعيب[3]

،كلية الاقتصاد المنزلي - جامعة المنوفية [1]، المعهد القومي للتغذية[2]، وزارة الصحة المصرية[3]

الملخص العربى:

الهدف: فحص و تقييم العلاقة بين الحالة الاجتماعية الاقتصادية ومعدل كتله الجسم و مستوي فيتامين د في الدم في اشخاص مصريين مصابين بالسمنة.

الطريقة: تم قياس معدل فيتامين د 3 في الدم لعدد 217 شخص من البالغين المصريين الذين تتراوح أعمارهم بين 19 - 50 سنة حسب الجنسوتم اخذ البيانات الخاصة بالقيم الديموغرافية والاجتماعية والاقتصادية و الطول ووزن الجسم و تم احتساب نسبة معدل كتله الجسم لكل شخص .

النتائج: وجد ان 63.5% من الاشخاص المشاركين في البحث (عددهم 138) يعانون من نقص في معدل فيتامين د.وكانت النسبه الاكبر من من يعانون من نفص معدل فيتامين د من النساء(82.6%) ووجد ان(83.3%) من من يعانون من نفص معدل فيتامين د متزوجون كما وجد ان (44.9%) منهم قد تلقي تعليما لمدة اكثر من 12 سنة . وايضا وجد ان اكثر من نصف المشاركين (56.5%) كانوا من ذوي الوظائف الفنية والمهنية والإدارية او الوظائف القيادية والفنية أو المهنية العليا .

كما وجد ان الاشخاص الذين يعانون من نقص معدل فيتامين د في الدم كانوا اصغرفي العمر من نظرائهم ذوي معدل فيتامين د طبيعي وايضا وجد ان الاشخاص الذين يعانون من نقص معدل فيتامين د في الدم هم الاعلي في متوسط معامل كتلة الجسم.

ووجد ان نقص معدل فيتامين د في الدم و التعليم العالي والمستوي الوظيفي من مؤشرات ارتفاع مؤشر كتلة .

الخلاصة : يعتبر نقص فيتامين د منتشر بين المصريين البالغين والذي يرتبط مع ارتفاع مؤشر كتلة الجسم والذي يتطلب أبحاث تداخلية أكثر لإختبار هل يمكن لمكملات فيتامين د ان تقلل من انتشار السمنة أم لا .