

Effect of Different Methods of Smoking on Serum Level of Vitamin D among University Students in Baghdad

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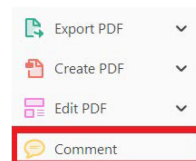
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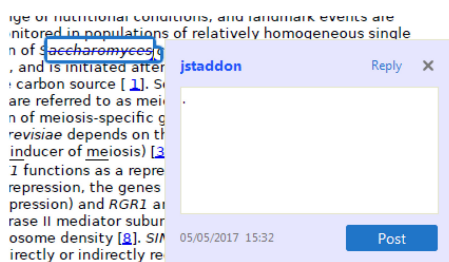


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
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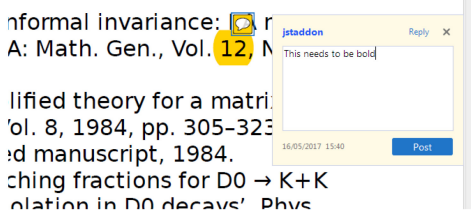
1. Small size (35-250 amino acids).
2. Absence of similarity to known proteins.
3. Absence of functional data which could not be the real overlapping gene.
4. Greater than 25% overlap at the N-terminus with another coding feature; over both ends; or ORF containing a tRNA.

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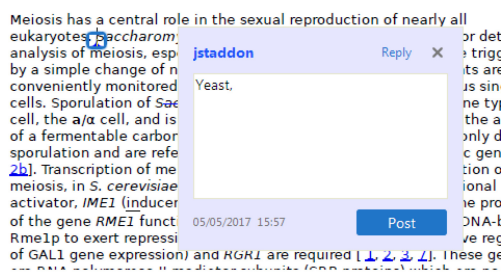


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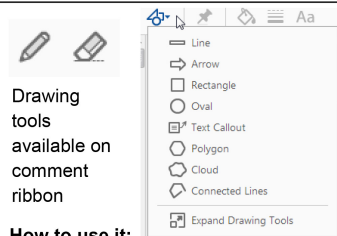
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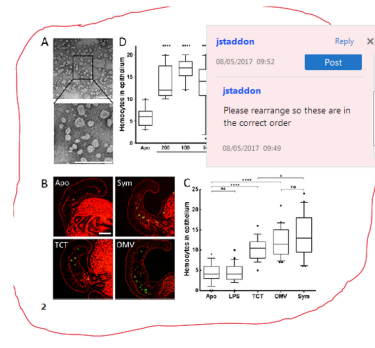


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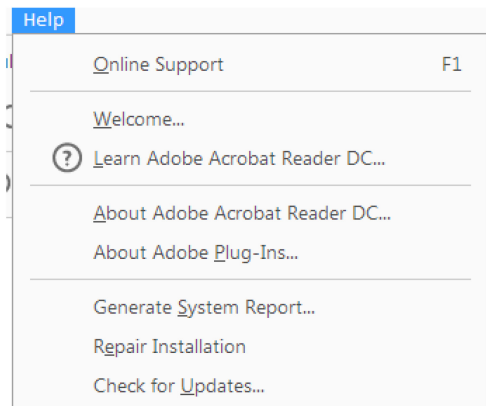
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Effect of Different Methods of Smoking on Serum Level of Vitamin D among University Students in Baghdad

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Abstract

Vitamin D has different biological actions in the body. Vitamin D has pleiotropic effects in multiple organ systems. Vitamin D deficiency has been found to have an inverse relationship with tobacco smoking. The objective of this study was to identify the prevalence of Vitamin D level and its correlates with tobacco smoking among University student male and female. Volunteer was conducted on a sample of university student, both males and females Iraq, during the period from January to December 2020. A pretested questionnaire was used for data collection adopted from previous standard national surveys and studies, and the questionnaire included information about sociodemographic characteristics and cigarette smoking habit. Blood sample collection was done to detect Vit D leve. The study included 160 university student adults, results found that the mean age of male 24.9 and the standard deviation are 3.593 while Female mean age group 26.5 and the standard deviation are 2.814. and it's found that the male started to smoke early at age less than 16 years while female start smoking at age around 21 years. Vitamin D level status of participant smoker (n = 80) with both genders male and female it showed that Vit D deficient 20cases represent (25%) in which female represents 11 (27%) while the male represent 9(22.5%) and Vit D insufficient 27cases represent (33.75%). in which female represents 14 (35%) while the male represents 13(35.5%) When inquired about harmful effects of shisha as compared to cigarettes, shisha was more harmful. The habit of water pipes or shisha smoker ware the highest number who had vit D deficient represent 12/20 (60%), followed by cigarettes 5/20(25%), cigar 2/20(10%), and finally the habit of using pipes 1/20(5%) Our study concludes that the knowledge about Vitamin D is low among all university students specially among female student.

Keywords: Tobacco smoking, Vitamin D levels, Deficiency risk vit D

1. Introduction

According to the Centers for Disease Control and Prevention (CDC), cigarette smoking harms almost all organs in the body and causes many diseases. It reduces the health of smokers in general. Dangers of smoking increases a person's risk of cancer, heart disease, stroke, vision problems, and gum disease (Varghese & Gharde, 2023). For several decades, cigarette smoking has remained a major avoidable public health hazard as 20% of adults worldwide are active cigarette smokers Facts on Gender and Tobacco (2010). Cigarette smoke (CS) contains more than 5,000 known toxic constituents and several other unidentified components, and it is one of the greatest

sources of human exposure to poisonous chemicals (Jamal et al., 2018). The chemical poisons contained in cigarette smoke can be easily transferred from the lungs to the bloodstream and even spread to almost every organ of the human body (Kassi et al., 2015). The main substance in tobacco, namely nicotine, has a relaxing effect, making it addictive for users. Systemically, exposure to cigarette smoke can disrupt vitamin D metabolism and damage tubules in the kidneys and liver. Unhealthy habits like smoking may influence serum Vitamin D concentrations which have not been well studied. The association of smoking with serum Vitamin D concentrations was unclear, and many published articles clarified lower serum Vitamin D

Received 9 April 2026; accepted 18 April 2026.
Available online 20 May 2026

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<https://doi.org/10.70492/2664-0554.1169>

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among tobacco smokers than non-smokers (Assari et al., 2019-, (Jiang et al., 2016). Studies in adults have reported that tobacco smoke exposure decreases the serum concentrations of both parathyroid hormone and Vitamin D (Manavi et al., 2015). Vitamin D plays a physiological role and its concentrations is important for the functioning of the metabolic, immune, and respiratory systems of both genders and in all ages (Hollis & Wagner, 2013).

Vitamin D deficiency remains a global health problem, and it has been a subject of interest and studied throughout the world (Holick & Chen, 2008). This study was conducted to identify the relationship between type of tobacco and cigarette smoking and serum Vitamin D level among Iraqi University students.

2. Materials and methods

A total of 160 apparently healthy University students were participated voluntarily in this study, and all of them agreed to participate after explaining the objective of the study by the researcher (the response rate: 100%) consist 80 participant have a habit of smoking and 80 participants were non-smoker, between the age group of 18–30 years.

2.1. A - Questionnaire form

With details of demographics: **age:** (18–30). **Gender:** (Male/Female), **Smoking Status,** currently smoke cigarettes, how many cigarettes do smoke per day, If the participant smoked cigarettes in the past, when did they start smoking cigarettes How long have been smoking (total years), Do participant smoke other tobacco products? all of these quantitative data were complete, and analysed.

2.2. B - Blood Sampling

Venous blood samples were collected, Serum samples were prepared immediately after phlebotomy for the measurement of the serum levels of Vitamin D was measured by VIDAS®25 OH Vitamin D TOTAL is employed to evaluate Vitamin D sufficiency.

Expected results

2.3. B - Data analysis

Quantitative methods are used to obtain measurable data that can be descriptive. Measuring the percentage value of respondents regarding the risk of deficiency involves using the categorical variables were represented in terms of number and percentages. The continuous variables were reported as mean \pm standard deviation using the Statistical Package for Social Science (SPSS version 20.0.)

3. Results

The research and data collection was conducted duration from first January till 31 of December 2024. Data were collected by filling in questionnaire; questions and interviews with university student participant included in the research sample. The number of samples involved in this study was 160 in which 80 were had a habit of different type of smoking and other group were non-smoker. All active smokers ($n = 80$) were willing to fill out a questionnaire and both group ($n = 160$) have their vitamin D levels measured. as well as answering the demographics questions such as age, gender(male/female).

Table 1 and Fig. 1: Frequency Distribution of 80 of the smoker participant university student Based on Age group (16–30 years) and their gender (male 40 participant and female 40 participant). Results found that the mean age of male 24.9 and the standard deviation are 3.593 while Female mean age group 26.5 and the standard deviation are 2.814.

Table 2 and Fig. 2: Frequency Distribution of 80 participant university student and the type of smoking of according to gender, Its showed that the main methods of smoking they preferred the cigarettes 15/40 (37.5%), followed by water pipes or shisha 13/40 (32.5%) on the other hand most of the female 35/40 (87.5) they like Water pipes or shisha and only 5/40 (12.5%) smoking cigarette.

Table 3 and Fig. 3: Frequency distribution of the number of cigarettes smoked per day by the study participants according to male and female It found that the a total of 32/80 (40%) they consume more than 10 cigarette per day in which the male represent the highest proportion 25/40(62%) While female represent 7/40 (17.5%).

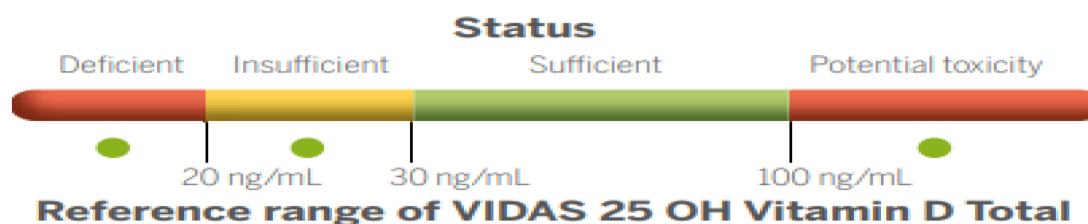


Table 1. Frequency Distribution of 80 of the smoker participant university student Based on Age group and their gender.

Age group /years	Smoker (n = 80)		Total n(%)
	Male n(%)	Female n(%)	
16-20	4(10)	0	4(5)
21-25	14(35)	15(37.5)	29(36.25)
Over 26	22(55)	25(62.5)	47(58.75)
Total	40(100)	40/100	80/100

Note: Male mean = 24.9 ST = 3.593.

Female mean = 26.5 St = 2.81.

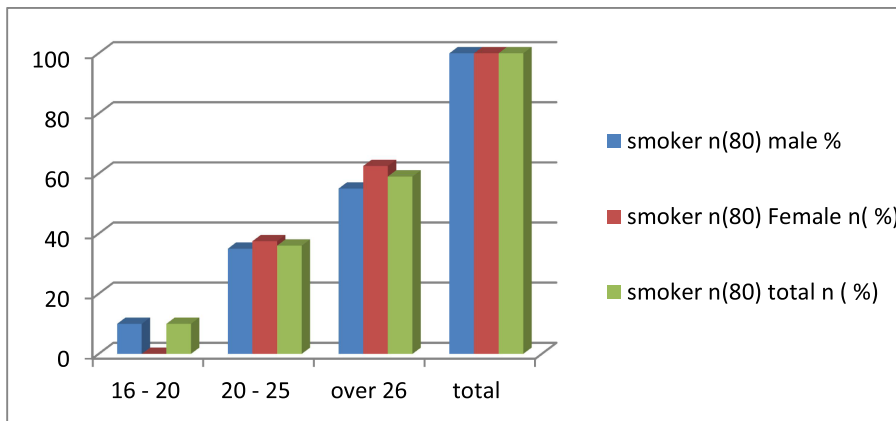


Fig. 1. Frequency Distribution of 80 of the smoker participant university student Based on Age group and their gender.

Table 4 and Fig. 4: Showed that the university students appear to be high proportion 67/80 (83 %) which the Start of smoking the first time when they are at university and we notice that most of the females smoke shisha or hookah represent 35/40 (87.5%), on the other hand most of the Male smoking shisha with cigarette or electron cigarette they represent 32/40 (80%).

Table 5 and Fig. 5: Association between participant smokers according to duration of smoking among males and females its notice that the duration of smoking 1-2 years represent 37/80 (46.25%). in which male represent 20/40 (50%) while the female represent 17/40 (42.5%).

Table 6: Association between Vitamin D level status of participant smoker (n=80) with both genders male and female it showed that Vit D deficient 20cases represent (25%) in which female represents 11/40 (27%) while the male represent 9/40 (22.5%), and Vit D insufficient 27cases represent (33.75%). in which female represents 14/40 (35%) while the male represent 13/40(35.5%).

Table 7: Association between Vitamin D level and type of smoking habit among 80 male and female smokers. It's showed that 20/80 (25%) of the participant had Vit D deficient (<10 ng/mL) in which 12/20(60%) use water pipes or shisha for

smoking followed by smoking Cigarettes 5/40(25%), Cigars2/20(10%), Pipes1/20 (5%)respectively.

4. Discussion

Smoking still one of the lifestyles and the major preventable reasons for ill health and causes death of millions of people in most of countries (Ekpu & Brown, 2015). It is one of the main risk factors of the expansion of atherosclerosis, coronary heart disease, acute myocardial infarction and sudden cardiac death (Goldenberg et al., 2003). Systemically, exposure to cigarette smoke influence serum Vitamin D concentrations the association of smoking with serum Vitamin D concentrations was unclear but most of the recent studies reported lower serum Vitamin D in current smokers than in never smokers (Stratton et al., 2001). However, most of the studies indicating these relationships have been performed in elderly people—mainly women—In this study Results found that the mean age of male 24.9 and the standard deviation are 3.593 while Female mean age group 26.5 and the standard deviation are 2.814. and it's found that the male started to smoke early at age less than 16 years while female start smoking at age around 21 years. In other study, tobacco smoking was high in both genders; it was found that 12%

Table 2. Frequency Distribution of the type of smoking of 80 participant university student according to gender.

Type of smoking	Male n(%)	Female n (%)	Total n(%)
Cigarettes	15(37.5)	5 (12.5)	20(25)
Cigars.	7 (17.5)	0	7(8.75)
Pipes	5 (12.5)	0	5(6.25)
Water pipes or shisha.	13 (32.5)	35(87.5)	48(60)
Total n (%)	40(100)	40 (100)	80(100)

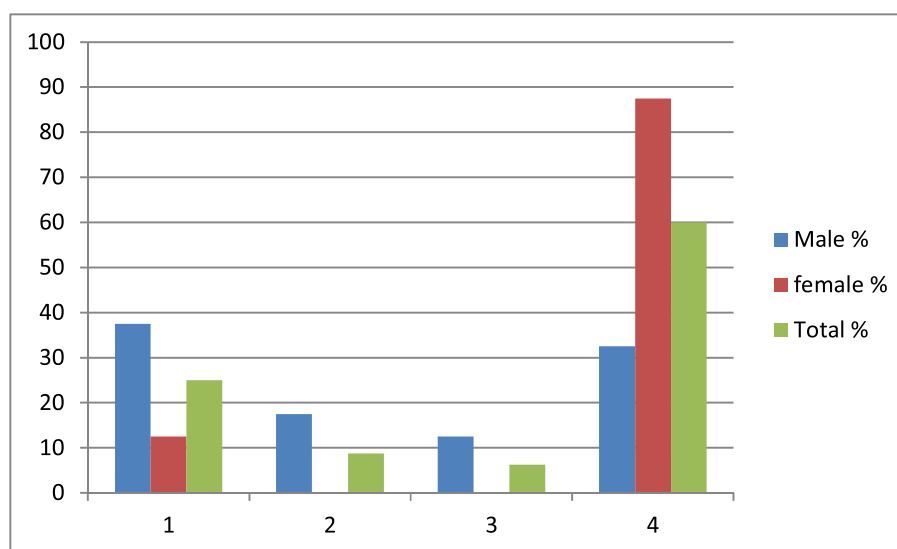


Fig. 2. Frequency Distribution of the type of smoking of 80 participant university student according to gender.

NOTES

1-Cigarettes. Tobacco wrapped in a roll of paper. . . .

2-Cigars. Tobacco wrapped in a tobacco leaf or the leaf of another plant.

3-Pipes. Loose-leaf tobacco smoked in a pipe.

4-Water pipes or shisha. A device used to smoke tobacco, consisting of a base filled with water, a tube, and a bowl where you burn tobacco

females smoked tobacco ([World Health Organization, 2014](#)). Male gender is the strongest predictor of tobacco smoking, a finding similar to that reported by ([Morrow & Barraclough, 2003](#)). The World Health Organization Report found that participants of in Middle East study showed that the male started shisha and cigarette smoking at the mean age of 18.7 years and female 17.5 years respectively ([W. H. Organization, 2019](#)). It also found in the National Health and Morbidity Survey of 1996/1997 in Malaysia ([Morrow & Barraclough, 2003](#)) This indicates that efforts have to be made from a young age to prevent tobacco.

According to the main methods of smoking which notice in this study, the student preferred the cigarettes 15/40(37.5), followed by water pipes or shisha 13/40 (32.5) on the other hand most of the female 35/40(87.5) they like Water pipes or shisha and only 5/40 (12.5) smoking cigarette There is a dif-

ferent way to smoke, the most known methods are (cigarettes, hookah, and vapor vape). Smoking can cause a variety of heart diseases and conditions. These include: Atherosclerosis, which increases the risk of heart disease, heart failure, or a heart attack, raise blood pressure, which raise the risk of stroke, Irregular heart rhythm, Coronary heart disease and Stroke ([W. H. Organization, 2019](#)). Prevalence of shisha smoking is high in general population as compared to the university students and the medical students ([Al-Naggar & Saghir, 2011](#), [Al-Naggar & Bobryshev, 2012](#)). Other Finding in this study that the a total of 32/80(40%) they consume more than 10 cigarette per day in which the male represent the highest proportion 25/40(62%) While female represent 7/40(17.5%). As an effect of smoking, long-time smoking could drive significant changes in the enzymatic antioxidant defense systems of smokers, and that will cause

Table 3. Frequency distribution of the number of cigarettes smoked per day by the study participants according to male and female.

No. of cigarettes/day	Male n(%)	Female n (%)	Total n(%)
0-5	5 (12.5)	22 (55)	27(33.75)
6-10	10 (25)	11(27.5)	21(26.25)
More than 10	25 (62.5)	07 (17.5)	32(40)
Total n (%)	40 (100)	40 (100)	80(100)

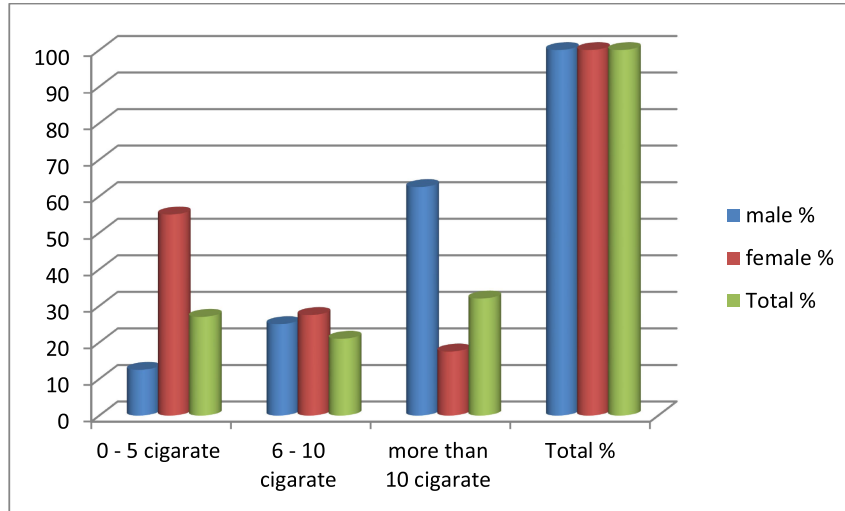


Fig. 3. Frequency distribution of the number of cigarettes smoked per day by the study participants according to male and female.

Table 4. Distributions of the time Start of smoking associated with gender.

Start of smoking	Male n(%)	Female n(%)	Total n(%)
Primary school	2(5)	0 (0)	2 (2.5)
Secondary school	6 (15)	5 (12.5)	11 (13.75)
University	**32(80)	*35(87.5)	67 (83.75)
Total	40 (100)	40 (100)	80 (100)

*All 35 females smoke shisha or hookah

**Most of Male smoking shisha with cigarette or electron cigarette

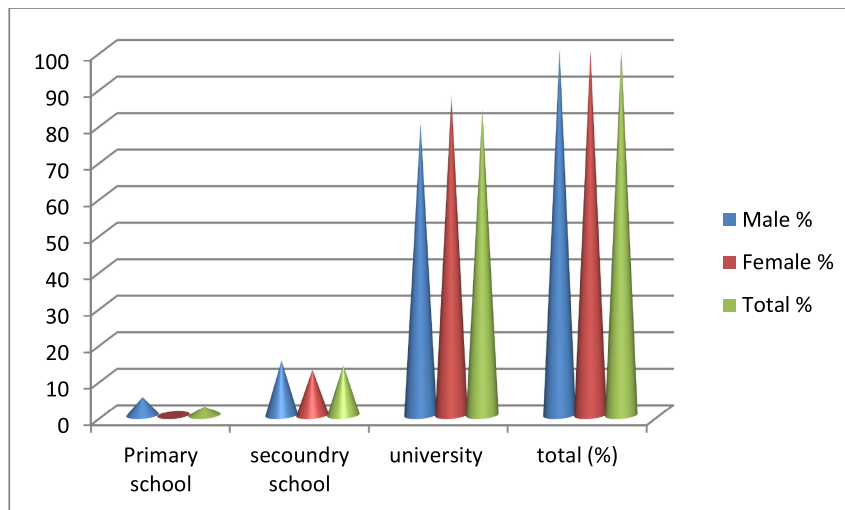


Fig. 4. Distributions of the time Start of smoking associated with gender.

Table 5. Association between participant smokers according to duration of smoking among male and female.

Duration of smoking (total years)	Male n(%)	Female n(%)	Total n(%)
Less than 1 year	12 (30)	20 (50)	32 (40%)
1-2 years	20 (50)	17 (42.5)	37 (46.25)
3-4 years	6 (15)	3 (7.5)	9 (11.25)
more than 5 years	2 (5)	0	2 (2.5)
Total n(%)	40 (100)	40 (100)	80 (100)

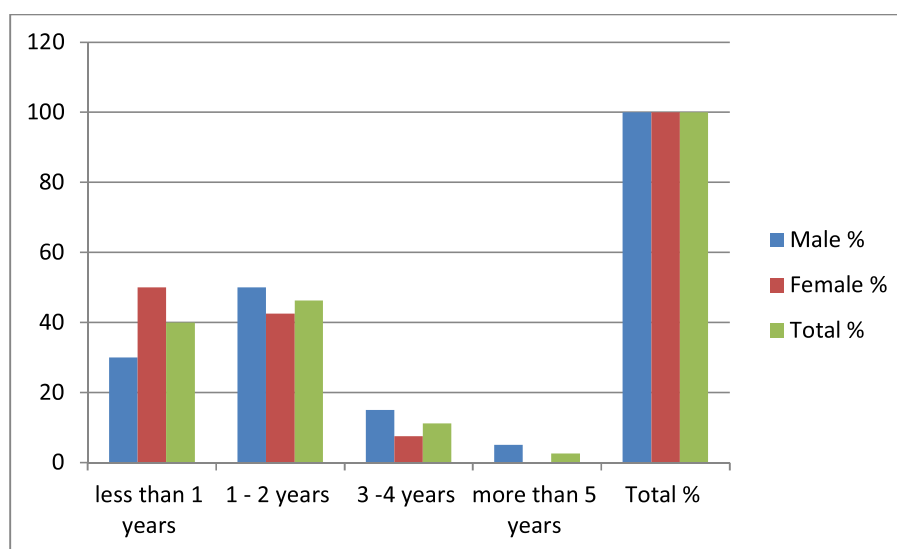


Fig. 5. Association between participant smokers according to duration of smoking among male and female.

Table 6. Association between Vitamin D level status of participant smoker (n = 80) with both genders male and female.

Concentration (Total Vit D)	Male n(%)	Female n(%)	Total n(%)
Deficient (<10 ng/mL)	9(22.5%)	11(27.5%)	20(25%)
Insufficient (10-30 ng/mL)	13(32.5%)	14(35%)	27(33.75%)
Sufficient(30-100 ng/mL)	18 (45%)	15(37.5%)	33(41.25%)
Total n(%)	40(100 %)	40(100%)	80(%)

Table 7. Association between Vitamin D level and smoking habit among 80 male and female smokers and ex-smokers.

Type of smoking	Deficient (<10 ng/mL)	Insufficient (10-30 ng/mL)	Sufficient (30-100 ng/mL)	Total N(%)
Cigarettes	5(25%)	8(29.6)	7(21.2%)	20(25%)
Cigars.	2(10)	2(7.4)	3(9%)	7((8.75%)
Pipes	1(5%)	2(7.4)	2(6.1 %)	5(6.25%)
Water pipes or shisha	12(60)	15(55.6)	21(63.7)	48(60%)
Total n(%)	20(25%)	27	33	80(100)

a rise in oxidative stress condition, This results are in agreement with other study (Joshi et al., 2020) who said that Smokers' blood and tissues' antioxidant defense systems are disrupted and subjected to oxidative stress as a result of the prolonged inhalation of reactive free radicals found in tobacco's gas and tar phases. On the other hand its notice that the duration of smoking 1-2 years represent 37/80 (46.25%). in which male represent 20/40(50%) while

the female represent 17/40 (42.5%). Studies in adults have reported that tobacco smoke exposure decreases the serum concentrations of both parathyroid hormone and Vitamin D leading to poor absorption of calcium from the gastrointestinal tract and an acceleration of bone loss (Kassi et al., 2015). Accordingly its appear in this study that the high proportion 67/80 (83 %) which they Start smoking the first time when they are at university and we notice that most

of the females smoke shisha or hookah represent 35/40 (87.5%), on the other hand most of the Male smoking shisha with cigarette or electron cigarette they represent 32/40 (80%). Most of Male smoking shisha with cigarette or electron cigarette Prevalence of shisha smoking is high in general population as compared to the university students and the medical students (Al-Naggar & Bobryshev, 2012). The association between Vitamin D level status of participant smoker (n = 80) with both genders male and female it showed that Vit D deficient 20 cases represent (25%) in which female represents 11/40 (27%) while the male represent 9/40 (22.5%) and Vit D insufficient 27 cases represent (33.75%). in which female represents 14/40 (35%) while the male represent 13/40 (32.5%) That's mean the female showed higher deficiency of Vit D than male, The exact mechanisms by which smoking affects Vitamin D metabolisms are still unclear. But other possible explanation is that chemicals in tobacco smoke may have a direct effect on Vitamin D metabolism and function (Soldin et al., 2011, Al-Murshedi & Baiee, 2018). Association between Vitamin D level and type of smoking habit among 80 male and female smokers. It's showed that 20/80 (25%) of the participant had Vit D deficient (<10 ng/mL) in which 12/20 (60%) use water pipes or shisha for smoking followed by smoking Cigarettes 5/40 (12.5%), Cigars 2/20 (10%), Pipes 1/20 (5%) respectively Perception about shisha containing flavour, tar, nicotine, smell, carbon monoxide, its water filtering toxin and more health effects on human In Middle Eastern countries, water pipes (hookah, shisha) are still a common way to inhale tobacco smoke (W. H. Organization, 2019). Previous research by (Yang et al., 2021). shows smokers have lower vitamin D concentrations than non-smokers. So, smokers can trigger a more significant vitamin D deficiency than non-smokers.

5. Conclusions

Our study concludes that the deficiency of Vitamin D is low among all university students but slightly higher in females students. and it's found that the male started to smoke early at age less than 16 years while female start smoking at age around 21 years they consume more than 10 cigarette per day the male represent the highest proportion of the participant had Vit D deficient (<10 ng/mL) in which use water pipes or shisha for smoking

Acknowledgment

This work was supported by the College of Al Nisour University, we would like to Thank the Presi-

dent of the University, Professor Abed Jawed, and the workers of the laboratory, as well as the participants sharing in this research.

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