



PREVALENCE OF VITAMIN D DEFICIENCY AMONG HOUSEWIFE IN DELHI

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Abstract:

As we know that vit-D is epidemic nutritional deficiency in the world. The treatment of vit-D deficiency is untreated and under diagnosed. Housewives are the section of society which is not given prior importance in terms of health. They are the most vulnerable section of the society. When it comes to housewife they have to perform all the household chores due to which they are left with little or no time for selfcare. Women are more prone to vit-D deficiency especially the one who are housewives and they are bounded to a particular area and for whole day they will be at home and doesn't expose themselves out. In concern of women's health and to bring prevalence of vitamin-D deficiency among housewife in Delhi this study was conducted.

In order to study the prevalence of vitamin-D deficiency among housewife in Delhi. Women who are housewives and between the age group of 20-30 are recruited. Around 100 women participated in the survey. Study was done through survey method, it included various questions regarding their general information, anthropometric assessment, lifestyle pattern, dietary pattern and their knowledge and awareness regarding vitamin-D deficiency.

Thus it was calculated that among 100 women participant 84% of women knows what is vit-D deficiency and rest of 12% of women doesn't know what is vit-D deficiency, so majority of them are aware of it but some needs to be aware of vit-D deficiency. only 14% of women says that low exposure to sunlight may lead to vitamin-D deficiency whereas 86% of women don't feel like that. when checked with the health status of housewife in Delhi. came to know that among 100 women only 12% of women had excellent health, while 36% of women has good health status and 52% of women has poor health status. when asked them about maintain their health. how many of them do exercise, only 43% women exercise and 57% of women doesn't practice exercise at all, whereas 47% doesn't go for anything. 47% of women are not even aware combination of calcium and vit-D rich food together. 53% of women are facing symptoms of vitamin-D deficiency. 17% of women have muscle weakness and pain, 16% of women have body pain, 4% of women have mood change such as depression and 4% of women has fatigue. 27% of women are done with bone mineral density test and 73% of didn't go for test. 55% of women have severe vitamin-D in their body, 10% women have moderate vitamin-D deficiency and 9% of women have low vitamin-D condition.

Keywords: VIT-D – Vitamin D deficiency, Awareness, Housewife.

I. INTRODUCTION

Vitamin D, the sunshine vitamin, it plays a crucial role in a plethora of physiological functions and associating vitamin D deficiency with many acute and chronic illnesses including disorders of calcium metabolism, autoimmune diseases, some cancers, type 2 diabetes mellitus, cardiovascular disease and infectious diseases. Vitamin D deficiency is now recognized as a global pandemic. The major cause for vitamin D deficiency is the lack of appreciation that sun exposure has been and continues to be the major source of vitamin D for children and adults of all ages. Vitamin D plays a crucial role in the development and maintenance of a healthy skeleton throughout life.

The main sources of vitamin-D are sunlight, diet and supplement. Some natural food source of vitamin-D are cod liver oil, egg yolk, mackerel, sardine, salmon and tuna fish. The number of foods naturally containing vitamin D in significant amounts is very limited, so vitamin-D fortified foods started producing which includes food such as fortified cereal, cheese, margarine, milk, yogurt and orange juices. Other sources of vitamin-D are multivitamin-D3 supplements. The principal causes of low vitamin D levels are limited cutaneous synthesis due to inadequate sun exposure (sunscreen use, institutionalized or homebound status) or combined with low dietary intake of vitamin D rich foods.

Vitamin D intake is measured in micrograms (μg) or international units (IU), where $100\mu\text{g} = 4000\text{IU}$. Vitamin D status assessed as serum levels of 25 hydroxy-vitamin D (25(OH)D) is measured in millimoles per litre (mmol/L) or nanograms per millilitre (ng/ml), where $100\text{nmol/L} = 40\text{ng/ml}$. The level taken to signify deficiency of 50nmol/L is controversial. Vitamin D deficiency is diagnosed when 25(OH)D 30 ng/mL is considered sufficient, with 40–60 ng/mL being the preferred range.

Vitamin D deficiency is widespread nutritional deficiency in Delhi, yet it is most under-diagnosed and under-treated nutritional deficiency. Vitamin D deficiency is widespread in individuals irrespective of their age, gender, race, and geography, Vitamin D is photosynthesized in the skin on exposure to UVB rays. Sun exposure alone ought to suffice for vitamin-D sufficiency. However, vitamin-D deficiency is widely prevalent despite plentiful sunshine even in tropical countries like India.

Vitamin D is a fat-soluble vitamin that aids in the regulation of bone metabolism and calcium homeostasis. Vitamin D deficiency can cause osteomalacia and osteoporosis in women who stay at home. Cancer, heart disease, diabetes, autoimmune disease, hypertension infectious disease and depression have all been linked to vitamin D deficiency. Vitamin D is needed for skeletal health throughout life and can be gained by diet or cutaneous synthesis in reaction to sunlight. Fatty fish, fish oils, and fortified dairy products are the best sources of vitamin D in the diet (only available in some areas). Vitamin-D deficiency plays a vital role in calcium absorption and maintain skeletal integrity.

As housewife mostly stays at home, they spend greater part of their time in doing their household chores such as washing, cleaning, cooking and taking care of their kids. They left with only little time for their own self-care. To bring their health into consideration awareness must be created.

II. METHODOLOGY:

2.1 SELECTION OF SUBJECT

Housewife are more prone to vitamin deficiencies especially vitamin-D Deficiency. This deficiency leads to many health disorders so there should be awareness among women to get rid of these health issues and they can inculcate good practices in their lifestyle pattern to overcome these kinds of health related disorders.

2.2 SELECTION OF AREA

Random samples were selected from different places of Delhi. This area was chosen due to the easy accessibility.

2.3 ANTHROPOMETRIC MEASUREMENT

Six parameters were used for anthropometric measurement: height (cm), weight (kg), waist measurement, hip measurement, waist-hip ratio, Body Mass Index.

2.3.1 Height (cm)

Is the measurement of the length in a standing position by using a stadiometer. The head should be in the Frankfurt position (a position where the line passing from the external ear hole the lower eye lid is parallel to the floor).

The shoulder and the heels should touch the vertical stand and measurements are recorded to the nearest millimetre.

2.3.2 Weight (kg)

Is the measurement of the body mass by using a non-electrical or electrical weighing machine, the subject stands on the platform of the scale.

2.3.3 Waist measurement

It helps to identify the existence of metabolic syndrome, the most common way to measure abdominal obesity. It is the circumference of the abdomen.

2.3.4 Hip measurement

Hip measurement is defined as hip measure which is 2 inches below the belly button, or the widest area of the body.

2.3.5 waist-hip Ratio

After getting each measurement (waist and hip) the WHR was calculated by using this formula:

$$\text{WHR} = \frac{\text{Waist circumference in inches}}{\text{Hip circumference in inches}}$$

2.4 FOOD FREQUENCY QUESTIONNAIRE

Food frequency questionnaire was used to collect the data. It was used to assess the nutrient intake across the housewives population in Delhi. Food frequency consists of food from all food groups that recorded intakes based on: daily, weekly once, weekly twice, weekly thrice and monthly.

I. RESULTS AND DISCUSSIONS:

The results of the study entitled, "Prevalence of vitamin-D among housewife in Delhi", is presented and discussed.

A. General information of the subject.

The general information of the selected subjects is discussed below:

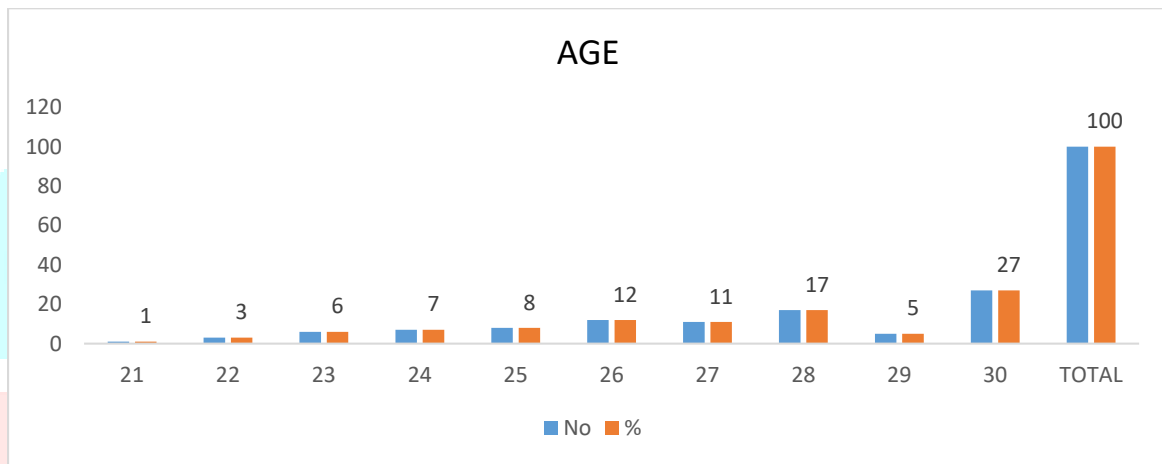
AGE: The age distribution of the selected subjects was recorded to know which age group of women were selected to conduct the survey.

1. AGE ANALYSIS

1. TABLE – AGE GROUP DISTRIBUTION OF THE SUBJECT

Age in years	No	%
21	1	1.0
22	3	3.0
23	6	6.0
24	7	7.0
25	8	8.0
26	12	12.0
27	11	11.0
28	17	17.0
29	5	5.0
30	27	27.0
TOTAL	100	100

FIGURE - I

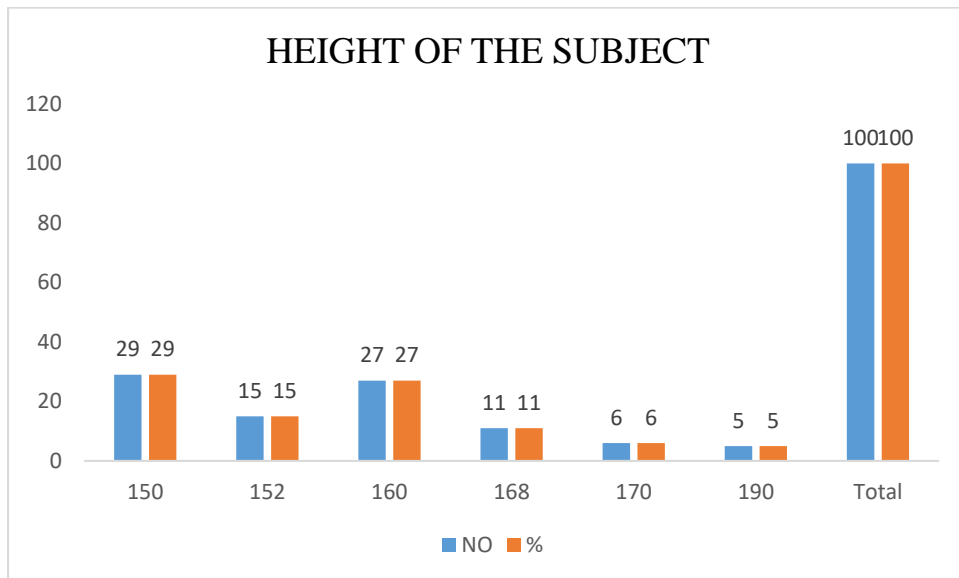


From table -1 ,from the above table ,it was noticed that maximum number of housewife attend the survey were 27 who lies under the age group of 30 , 5 women who participated under the age of 29 ,17 women with age of 28 , 11 women from 27 age group, 12 women with age of 26 , 8 women with age of 25 , 7 women with the age of 24 , 6 women with the age of 23 , 3 women with the age of 22 , then at last participants with minimum number of participation and age group is 1 with 21 years of age.

2. TABLE -HEIGHT OF THE SUBJECT

HEIGHT	NO	%
150	29	29.0
152	15	15.0
160	27	27.0
168	11	11.0
170	6	6.0
190	5	5.0
Total	100	100.0

FIGURE 2

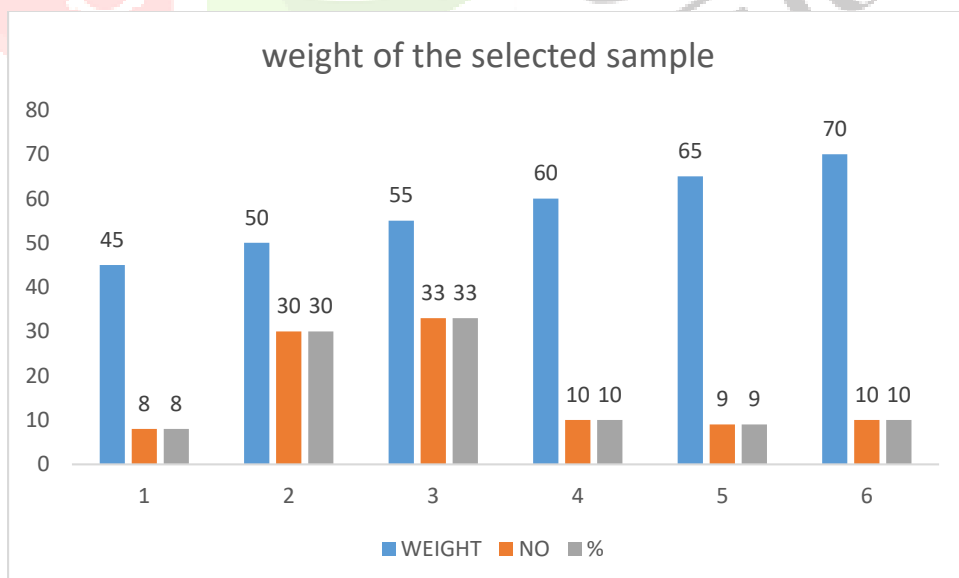


Among the selected 100 samples 29% belong to 150cm height, 15% belongs 152cm height, 27% of women belong 160cm of height, 11% of women belong 168cm of height, 6% of women belong to 170cm of height and 5% of women belong to 19-cm of height

TABLE-3 WEIGHT OF THE SUBJECT

WEIGHT	NO	%
45	8	8
50	30	30
55	33	33
60	10	10
65	9	9
70	10	10

FIGURE 3



Among the 100 selected sample 8% of women has 45kg weight, 30% of women has 50kg weight, 33% of women has 55kg weight, 10% of women has 60kg weight, 9% of women has 65kg weight and another 10% of women has 70kg weight.

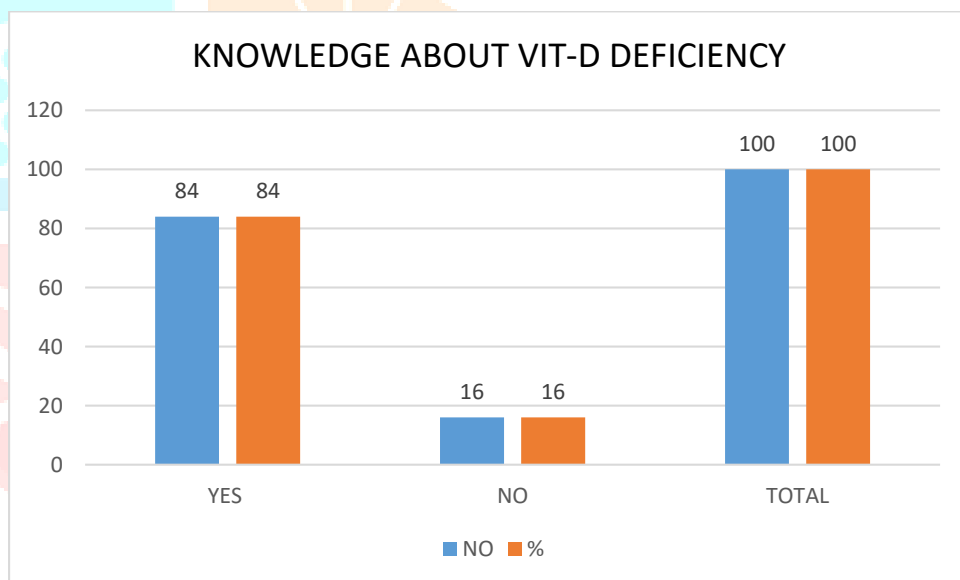
TABLE-4 BMI

CLASSIFICATION	RANGE	%
Underweight	BELOW 18.5	4
Normal weight	18.5-24.9	38
Over weight	25.0-29.9	46
Obesity class I	30.0-34.9	11
Obesity class II	35.0-39.9	-
Obesity class III	ABOVE 40	1

From the above BMI table know 4% of women are underweight ,38% of women are in normal weight, 46% of women are overweight and 1% of women are above obese which is very dangerous for their health.

TABLE-4 WHAT IS VIT-D DEFICIENCY

KNOWLEDGE ABOUT VIT-D DEFICIENCY?	NO	%
YES	84	84.0
NO	16	16.0
TOTAL	100	100

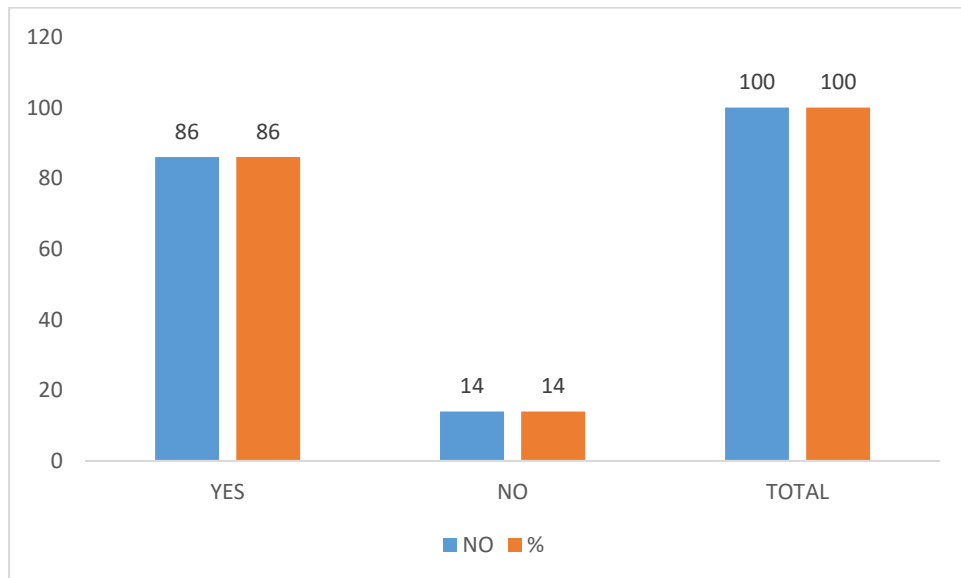
FIGURE 2

From table-2 noticed that 84 % of housewives knows what is vitamin-D deficiency and 16% of housewife doesn't know.

TABLE – 3 NEED OF SUNLIGHT IN PANDEMIC

NEED OF SUNLIGHT IN PANDEMIC?	NO	%
YES	86	86.0
NO	14	14.0
TOTAL	100	100

FIGURE 3

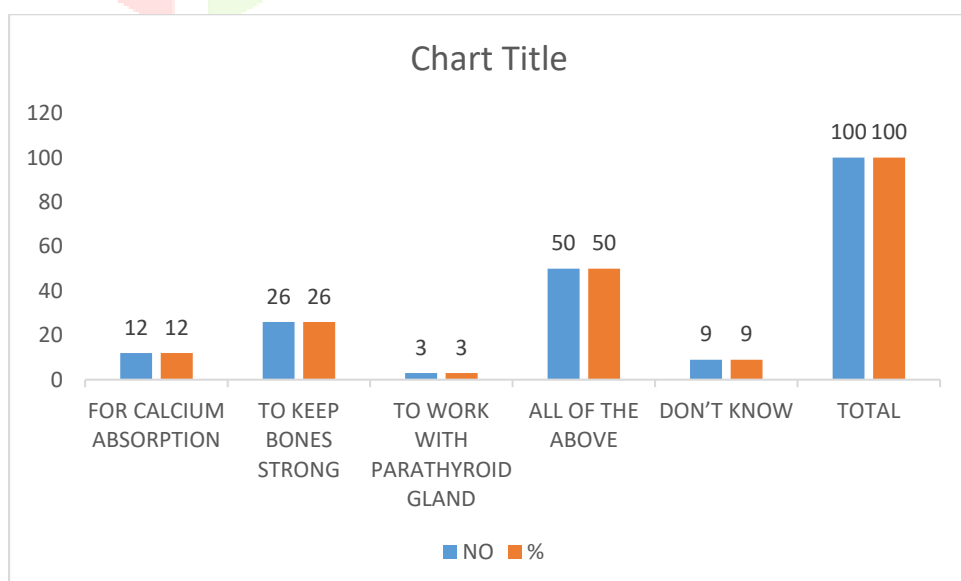


From the table-3 noticed that 86% of housewife thinks as cases are high in Delhi, exposure to vitamin-D deficiency is important to boost the immunity. Whereas 14% doesn't feel so.

TABLE 4.IMPORTANCE OF VITAMIN D

IMPORTANCE OF VIT-D	NO	%
FOR CALCIUM ABSORPTION	12	12.0
TO KEEP BONES STRONG	26	26.0
TO WORK WITH PARATHYROID GLAND	3	3.0
ALL OF THE ABOVE	50	50.0
DON'T KNOW	9	9.0
TOTAL	100	100

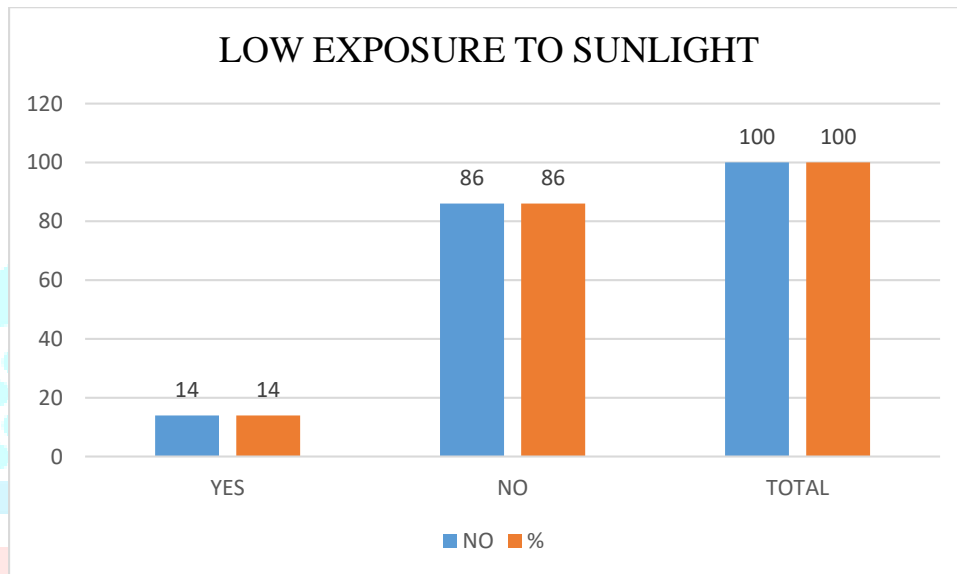
FIGURE 4



From the figure-4 noticed that maximum number that 26 women says that vitamin-D is needed by our body to keep bones strong , 12% of women thinks it is for calcium absorption in our body and 3% says it to work with parathyroid gland.

TABLE 5 - LOW SUNLIGHT EXPOSURE, MAY LEAD TO VITAMIN D DEFICIENCY?

LOW EXPOSURE TO SUNLIGHT MAY LEAD TO VID-D DEFICIECNY	NO	%
YES	14	14.0
NO	86	86.0
TOTAL	100	100

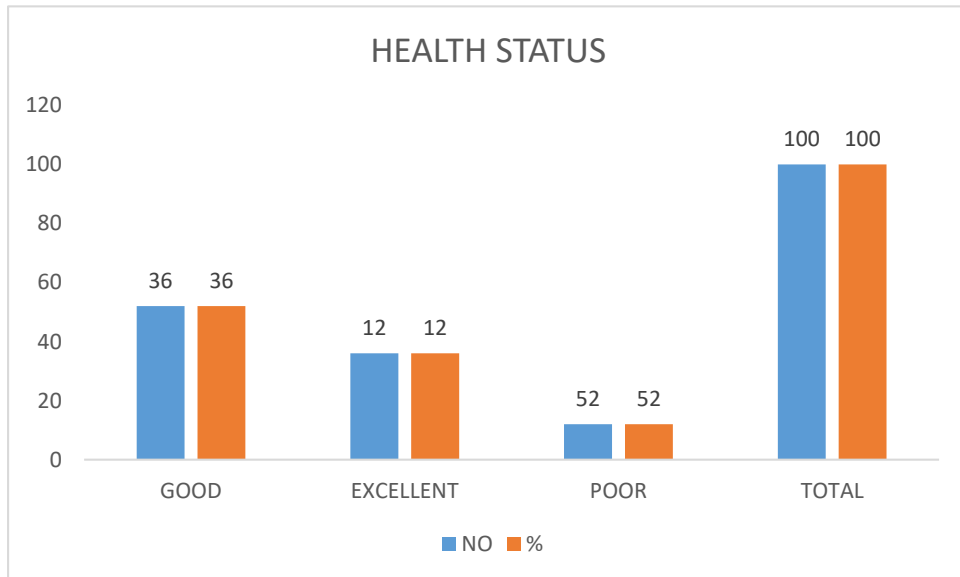
FIGURE 5

From the table 5- It depicts that 86% women agrees for low exposure to sunlight may lead to vitamin-D deficiency whereas 14 women are not agreed.

TABLE 6 .HEALTH STATUS

HEALTH	NO	%
GOOD	36	36.0
EXCELLENT	12	12.0
POOR	52	52.0
TOTAL	100	100

FIGURE 6



From the table 6- we can conclude the health status, Only 12% of women consider their health to be excellent, 36% of women says their health is good and 52% of women says they have poor health status.

TABLE 7.DO THEY EXERCISE

EXERCISE	NO	%
YES	43	43.0
NO	57	57.0
TOTAL	100	100

FIGURE 7

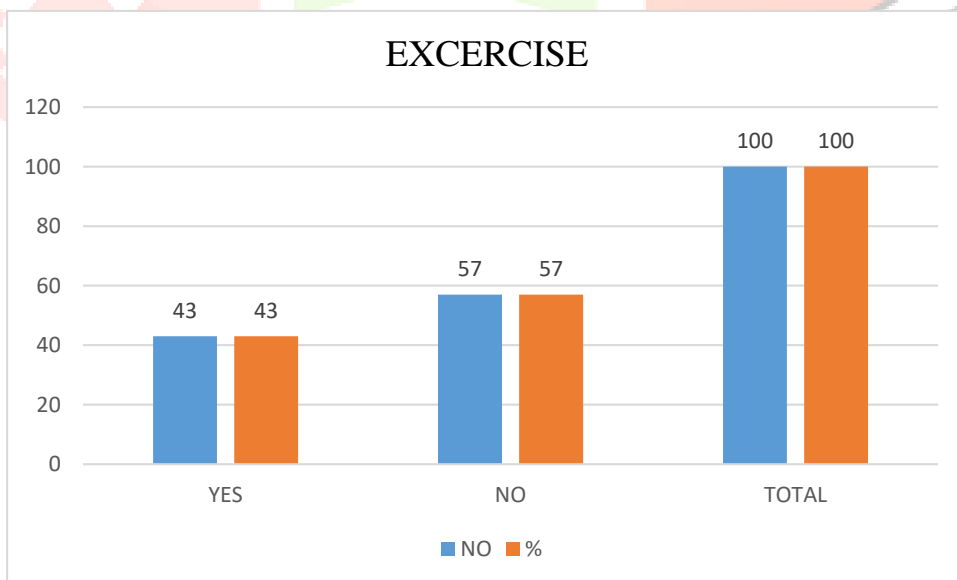


Table 7- Depict how many women does physical exercise regularly . Around 57% of housewife excersie regularly and 43% of womens doesn't exercise at all.

TABLE 8 - HOW OFTEN THEY EXERCISE

HOW OFTEN THEY EXERCISE	NO	%
DAILY	23	23.0
THRICE A WEEK	10	10.0
TWICE A WEEK	15	15.0
NEVER	52	52.0
TOTAL	100	100

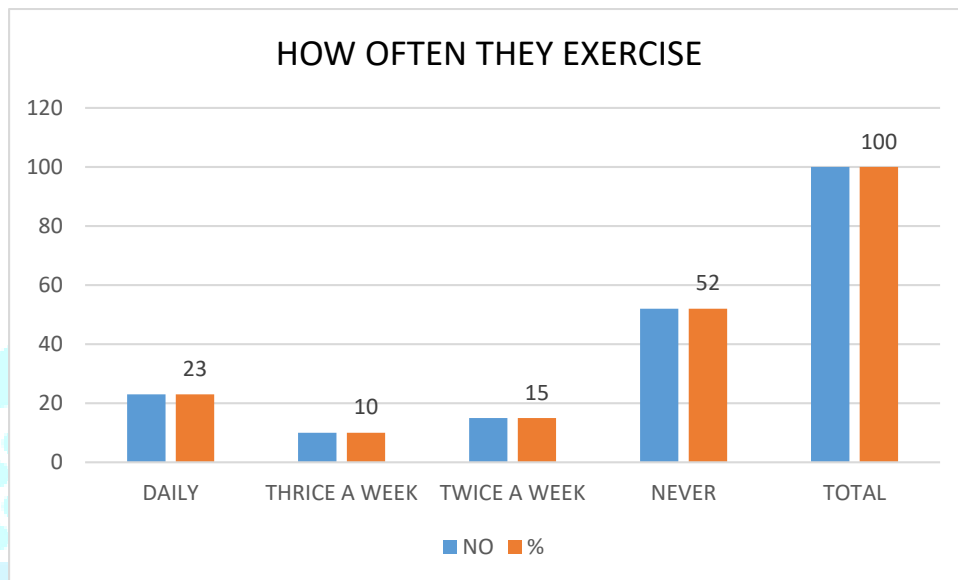
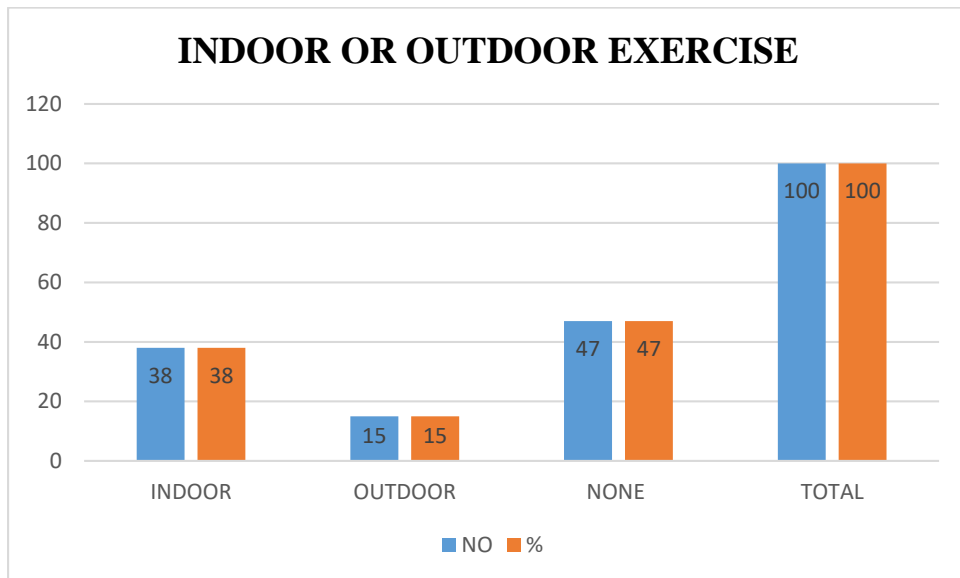
FIGURE 8

Table - 8 says depict that 52% of women never do any kind of exercises , 23% of women daily exercises, 15% of women exercise twice a week whereas 10% of women exercise only thrice a week. This show how often housewives are doing exercise.

TABLE 9-WHAT KIND OF EXERCISE THEY DO

WHAT KIND OF EXERCISE THEY DO	NO	%
INDOOR	38	38.0
OUTDOOR	15	15.0
NONE	47	47.0
TOTAL	100	100

FIGURE 9

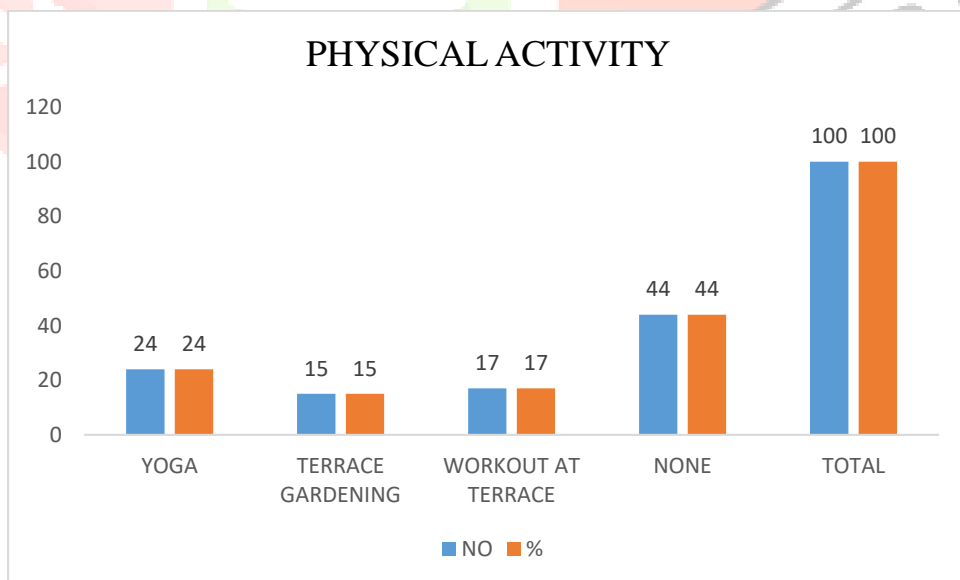


From table-9 we conclude that being a housewife 47% of women doesn't go for any kind of activity , 38% manages to do indoor exercises whereas only 15% of women does outdoor exercise.

TABLE 10-WHAT TYPE OF PHYSICAL ACTIVITY THEY PERFORM

PHYSICAL ACTIVITY	NO	%
YOGA	24	24.0
TERRACE GARDENING	15	15.0
WORKOUT AT TERRACE	17	17.0
NONE	44	44.0
TOTAL	100	100

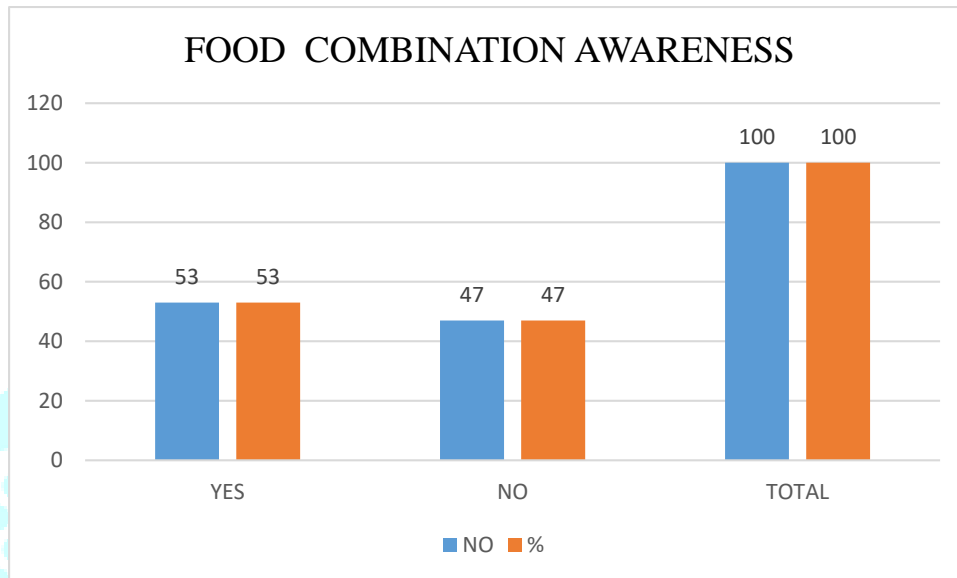
FIGURE 10



From figure no.10 we can see that 44% of women doesn't do any kind of physical activity , 24% of women does yoga , 17% of women do workout at terrace and 15% of women go for terrace gardening .

TABLE 11 -AWARENESS ABOUT COMBINATION OF CALCIUM AND VITAMIN- D RICH FOODS TOGETHER

BENEFITS OF CALCIUM AND VIT-D RICH FOODS	NO	%
YES	53	53.0
NO	47	47.0
TOTAL	100	100

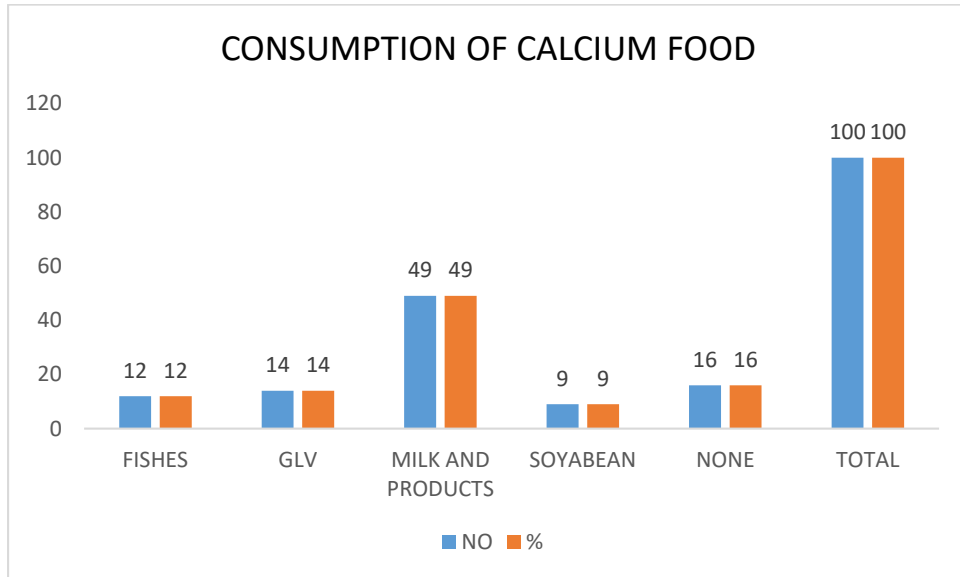
FIGURE 11

From the above figure no.11 we came to know that housewife who are residing in delhi , only 53% of women are aware about the benefits & combination of calcium and vit-d rich food together , whereas 47% of women are not even aware about the consumption of calcium and vit-d rich foods together.

TABLE 12-WHAT KIND OF CALCIUM RICH FOOD THEY INCLUDE IN DIET , TO IMPROVE THEIR BONE HEALTH

CALCIUM RICH FOOD IN DIET	NO	%
FISHES	12	12.0
GLV	14	14.0
MILK AND PRODUCTS	49	49.0
SOYABEAN	9	9.0
NONE	16	16.0
TOTAL	100	100

FIGURE 12

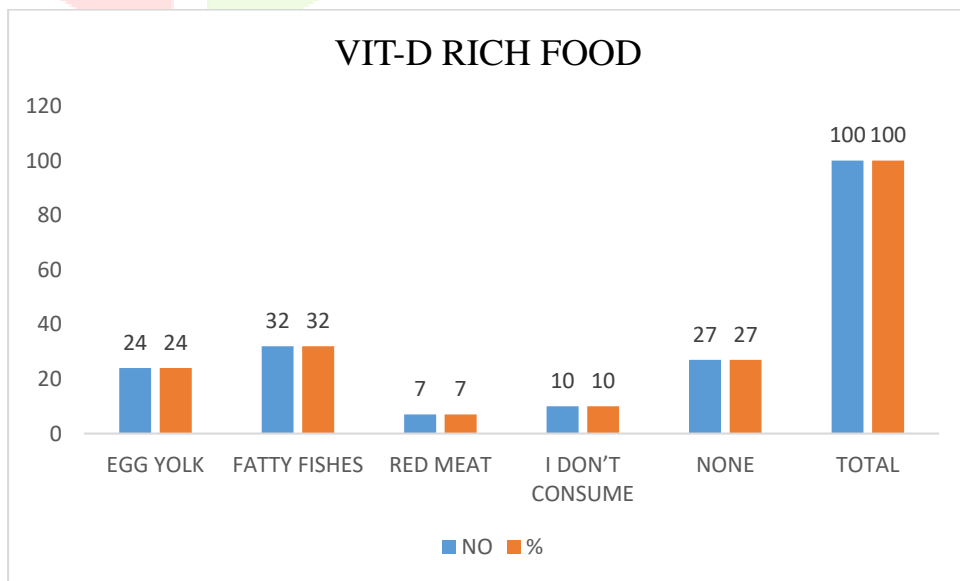


From the table – 12 we came to know that what kind of calcium rich foods they are including in their diet, 49% of women are taking milk and milk products, 16% of women doesn't take anything, 14% of women consume green leafy vegetables, 14% of women goes for fishes and 9% of women consumes soya bean as a source of calcium rich food in diet to improve their bone health.

TABLE 13-CONSUMPTION OF VIT-D RICH FOOD

VIT-D RICH FOOD	NO	%
EGG YOLK	24	24.0
FATTY FISHES	32	32.0
RED MEAT	7	7.0
I DON'T CONSUME	10	10.0
NONE	27	27.0
TOTAL	100	100

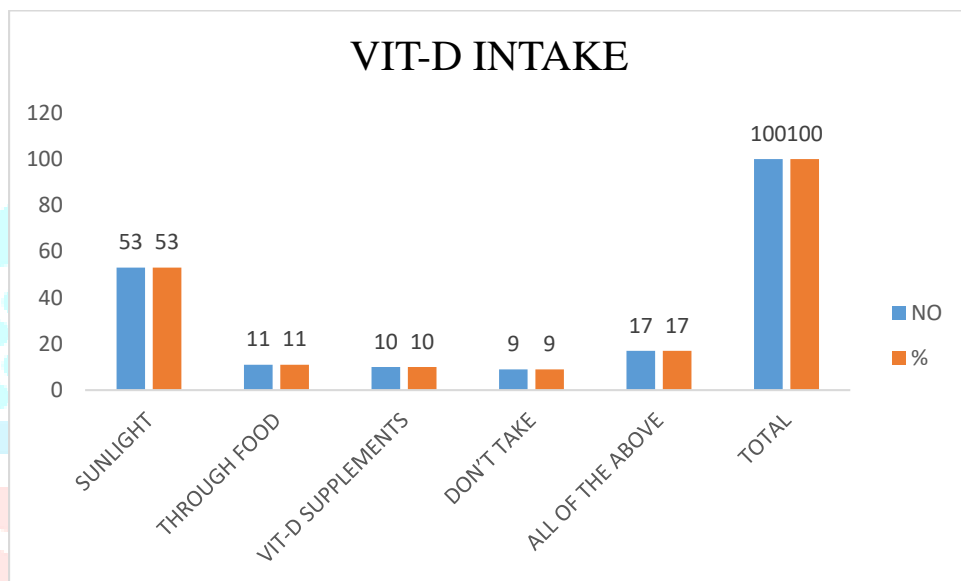
FIGURE 13



From the above figure no.13 we can conclude that 32% of housewife consume fatty fishes, 27% of women doesn't consume any vit-d rich foods, 24% of women include egg yolk as a source of vi-d rich food whereas 10% doesn't go for any vit-d rich sources and 7% of housewife include red meat as a vit-d rich food in their diet.

TABLE 14-BEING AT HOME, HOW DO YOU INTAKE VIT-D

BEING AT HOME HOW DO THEY INTAKE VIT-D	NO	%
SUNLIGHT	53	53.0
THROUGH FOOD	11	11.0
VIT-D SUPPLEMENTS	10	10.0
DON'T TAKE	9	9.0
ALL OF THE ABOVE	17	17.0
TOTAL	100	100

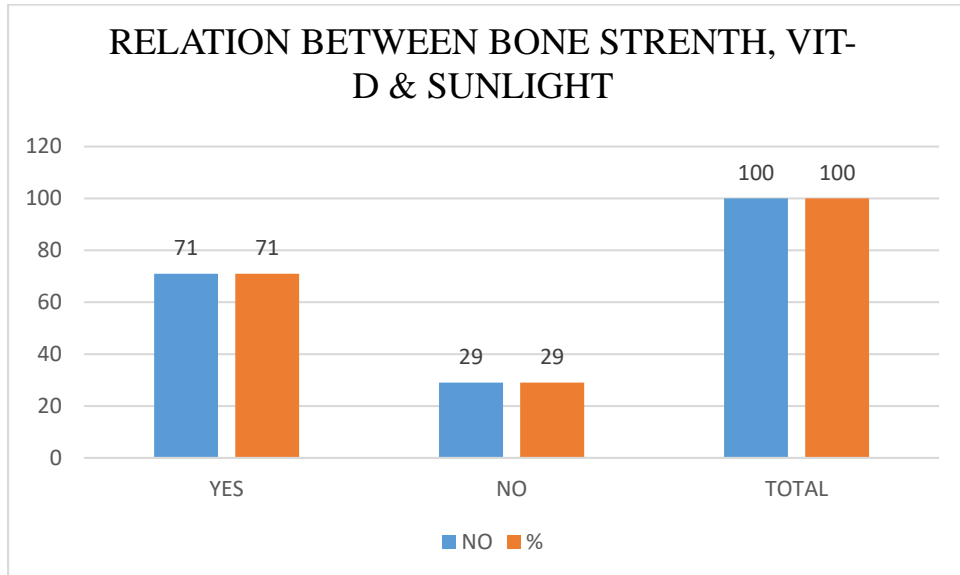
FIGURE-14

From the above table we can say that being at home how Delhi based women are managing to intake vit-d or in what form they are taking. 53% of women are intaking vit-d through sunlight, 11% of women through food, 10% women through vit-d supplements, 9% of doesn't take vit-d.

TABLE-15 RELATION BETWEEN BONE STRENGTH, VIT-D AND SUNLIGHT

RELATION BETWEEN BONE STRENGTH, VIT-D & SUNLIGHT	NO	%
YES	71	71.0
NO	29	29.0
TOTAL	100	100

FIGURE-15

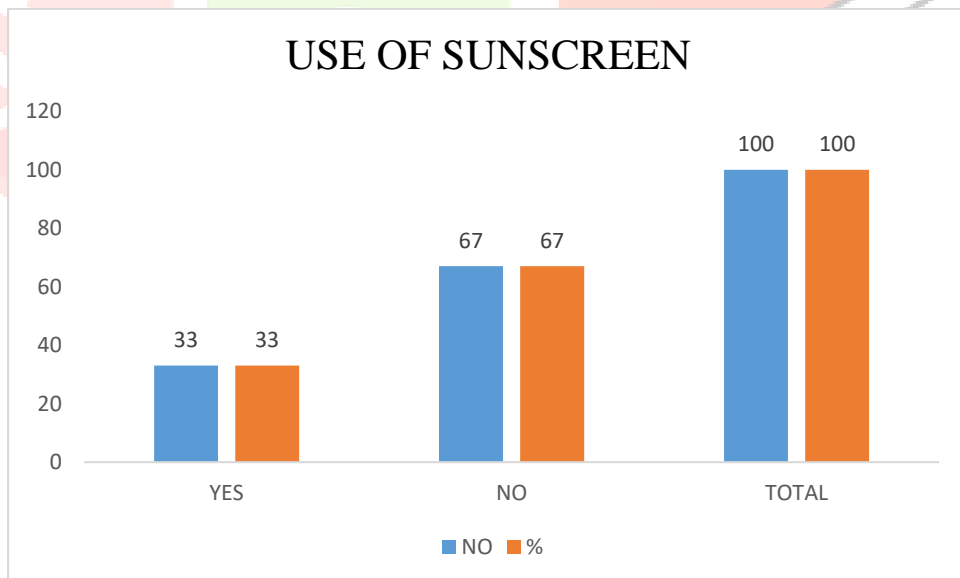


From table-15 as we know that sunlight helps in absorption of vit-d in our body, which aids in keeping our bones strong so here we can say how many housewife know about the relation between bone strength, vit-d and sunlight. 71% women are aware about the relation between bone strength, vit-d and sunlight, whereas 29% of women are not aware of it.

TABLE-16 DO YOU USE SUNSCREEN

DO YOU USE SUNSCREEN	NO	%
YES	33	33.0
NO	67	67.0
TOTAL	100	100

FIGURE 16

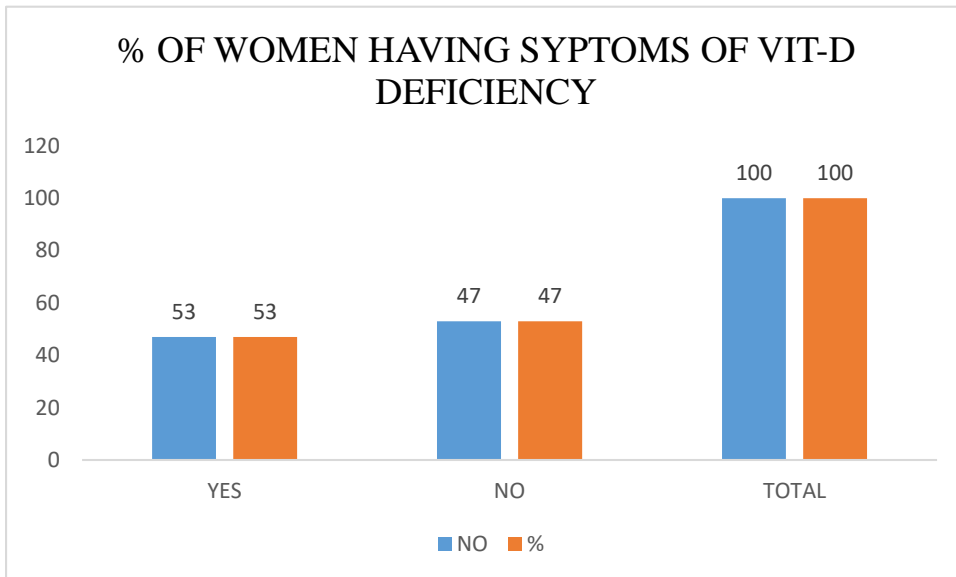


From the above figure no.16 we can say that 67% of women uses sunscreen and 33% of women doesn't apply sunscreen on their body.

TABLE-17 ARE YOU FACING ANY SYMPTOMS OF VIT-D DEFICIENCY?

ANY SYMPTOMS OF VIT-D DEFICIENCY?	NO	%
YES	53	53.0
NO	47	47.0
TOTAL	100	100

FIGURE-17

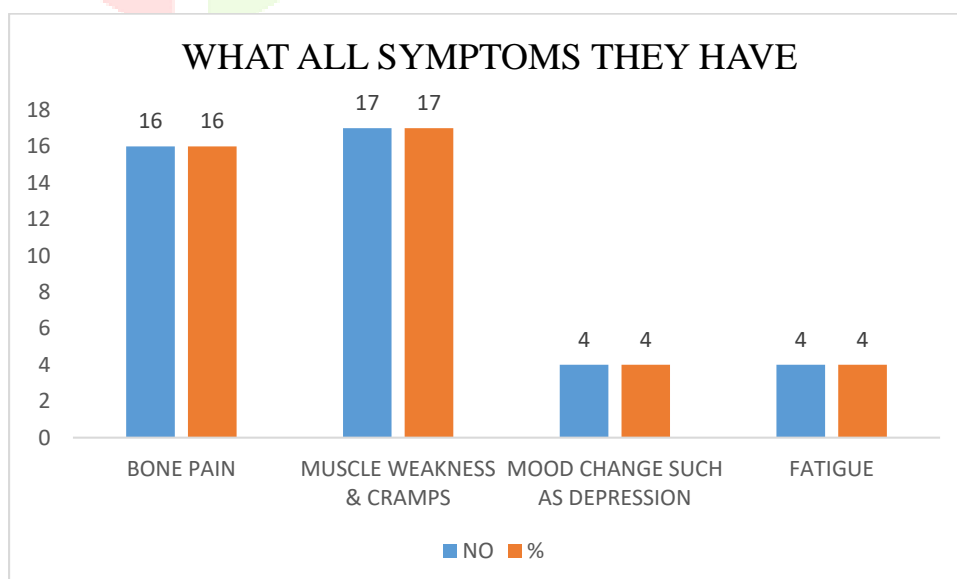


From the above figure no.17 we can say that symptoms of vit-d deficiency has been found among 53% of women and whereas 47% of women doesn't have any symptoms of vit-d deficiency.

TABLE-18 WHAT ALL SYMPTOMS THEY HAVE?

SYMPTOMS THEY HAVE	NO	%
BONE PAIN	16	16.0
MUSCLE WEAKNESS & CRAMPS	17	17.0
MOOD CHANGE SUCH AS DEPRESSION	4	4.0
FATIGUE	4	4.0
ALL OF THE ABOVE	8	8.0
NONE	51	51.0
TOTAL	100	100

FIGURE 18

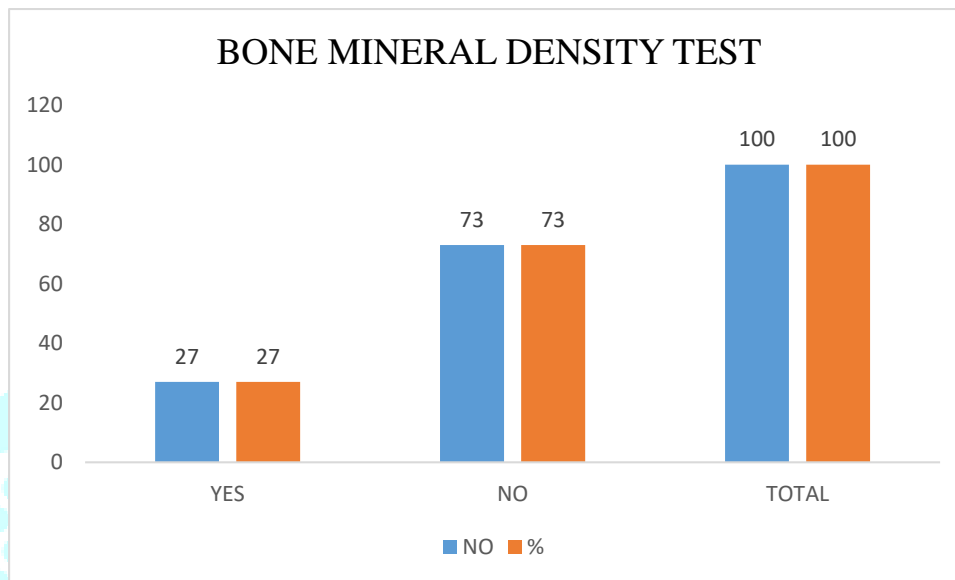


From the above figure we can conclude that 17% of women has muscle weakness and cramps as symptoms of vit-d deficiency. 16% of women has bone pain symptom, 4% of women has mood change such depression and 4% of women has fatigue symptoms.

TABLE-19 EVER DONE WITH BONE MINERAL DENSITY TEST?

EVER DONE WITH BONE MINERAL DENSITY TEST	NO	%
YES	27	27.0
NO	73	73.0
TOTAL	100	100

FIGURE 19

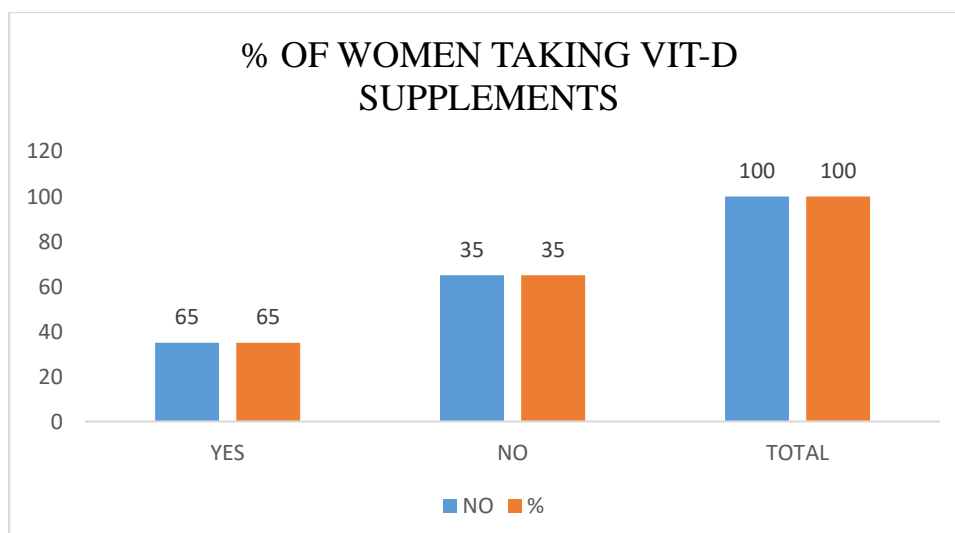


From the above figure no.19 we can say that how many women are done with bone mineral density test.out of 100 ,27% of women have been through bone mineral density test where 73% of women didn't go for test.

TABLE-20 DO YOU TAKE VIT-D SUPPLEMENT

HOW MANY OF YOU TAKE VIT-D SUPPLEMENT	NO	%
YES	65	65.0
NO	35	35.0
TOTAL	100	100

FIGURE 20

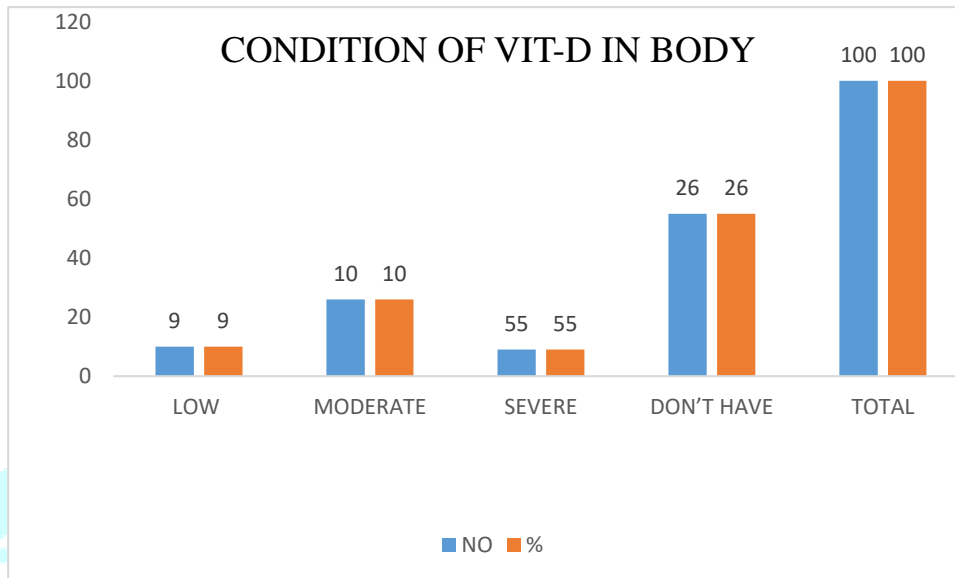


From the above table -20 we can say that 65% of women consume vit-d deficiency supplement and 35% of women doesn't.

TABLE-21 WHAT IS THE CONDITION OF VIT-D IN THEIR BODY

CONDITION OF VIT-D	NO	%
LOW	9	9.0
MODERATE	10	10.0
SEVERE	55	55.0
DON'T HAVE	26	26.0
TOTAL	100	100

FIGURE 21

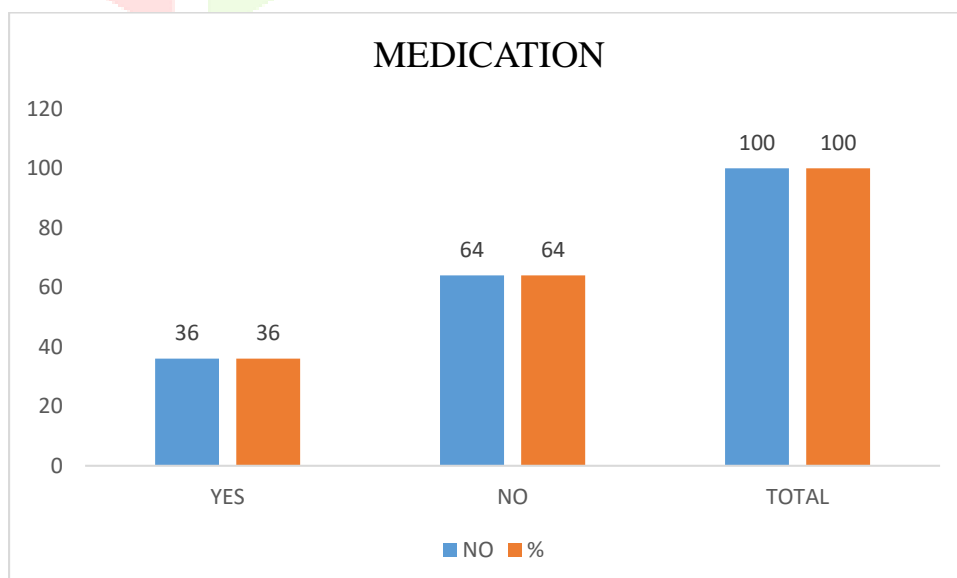


From the above figure no.21 we can say the condition of vit-d in womens body.26% women doesn't have vit-d deficiency , 10% of women have moderate vit-d deficiency,9% of women have low vit-d deficiency and 55% of women have severe vit-d condition.

TABLE-22 MEDICATION

EVER HAD VIT-D MEDICATION	NO	%
YES	36	36.0
NO	64	64.0
TOTAL	100	100

FIGURE 22

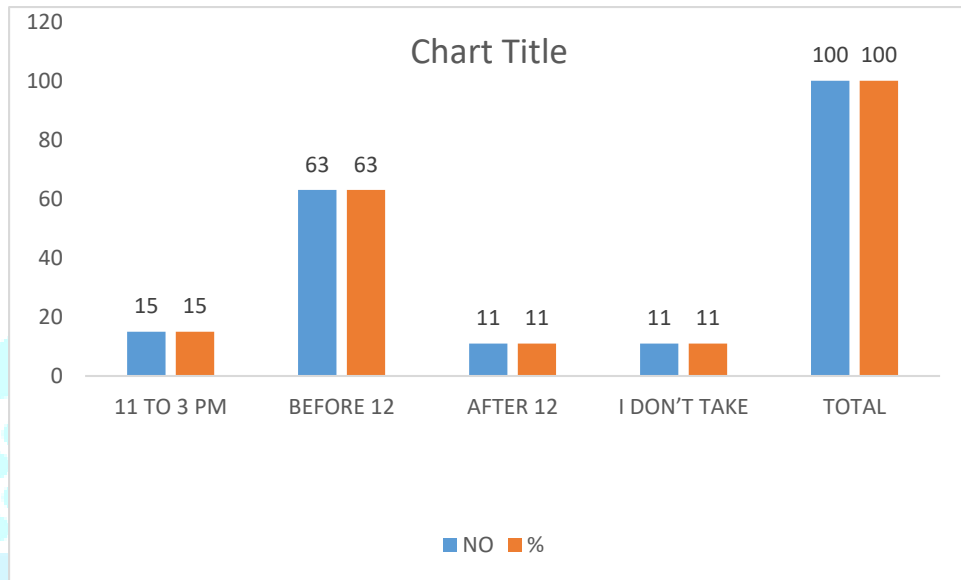


From the above figure no.22 we can say that 36% of women have medication for vit-d deficiency and 64% of women doesn't.

23 AT WHAT TIME THEY PREFER TO SIT UNDER SUN

TIME TO SIT UNDER SUN	NO	%
11 TO 3 PM	15	15.0
BEFORE 12	63	63.0
AFTER 12	11	11.0
I DON'T TAKE	11	11.0
TOTAL	100	100

FIGURE 23

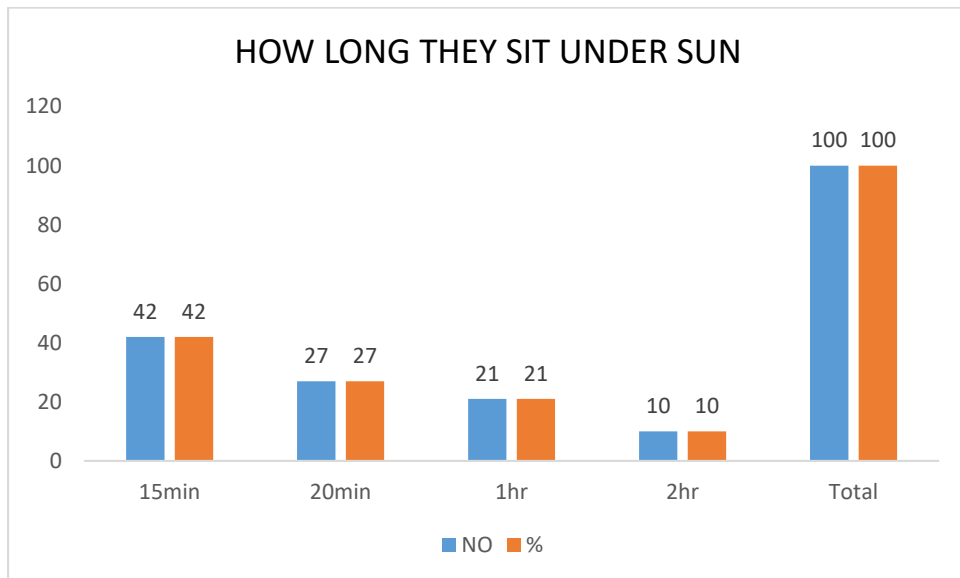


From the above figure it depicts that 63% of women sit under sun before 12pm, 15% of women sit under sun between 11 to 3 pm, 11% of women sit under sun after 12.

24 HOW LONG THEY SPEND IN SUN TO GET VITAMIN-D

HOW LONG SIT UNDER SUN	NO	%
15min	42	42.0
20min	27	27.0
1hr	21	21.0
2hr	10	10.0
Total	100	100

FIGURE 24

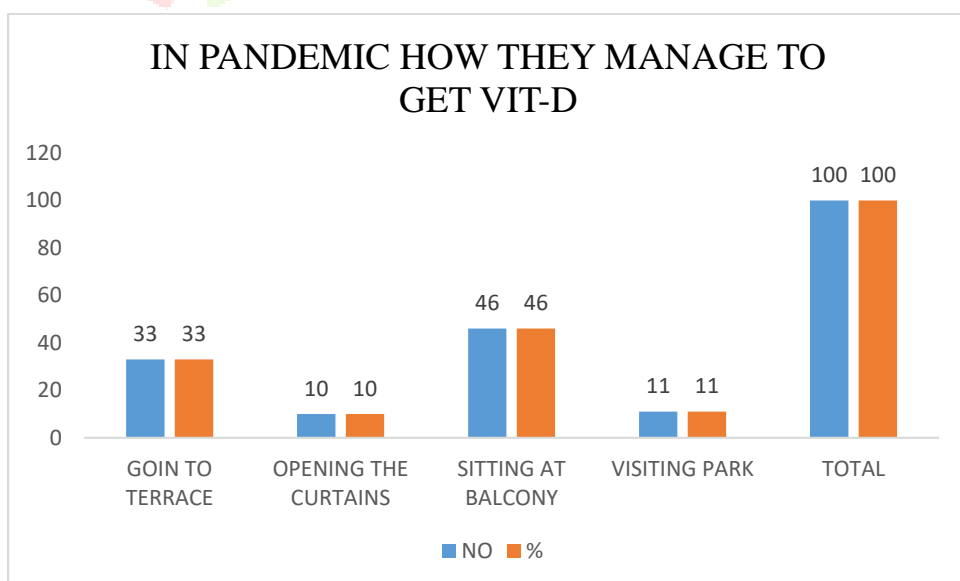


From the above figure no.24 it says that 42% of women manages to sit under sun for 15mins, 27% of women for 20 mins , 21% of women sits under sun for 1 hr and 10% of women sits for 2hrs a day under sun.

25 AMIDST PANDEMIC HOW THEY MANAGE TO GET SUNLIGHT

AMIDST PANDEMIC HOW THEY GET SUNLIGHT	NO	%
GOIN TO TERRACE	33	33.0
OPENING THE CURTAINS	10	10.0
SITTING AT BALCONY	46	46.0
VISITING PARK	11	11.0
TOTAL	100	100

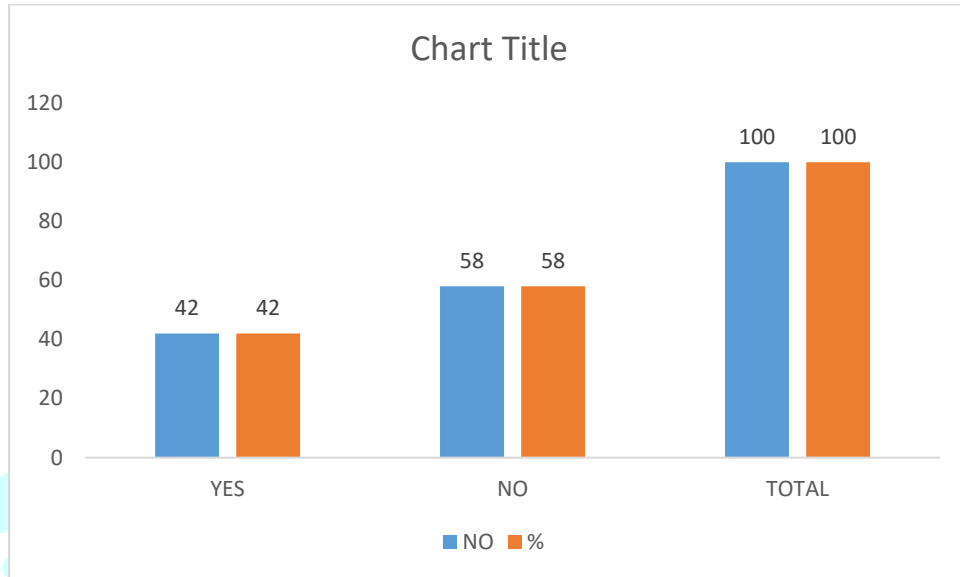
FIGURE 25



From the above how women manage to get sunlight in this pandemic.46% of women sits at balcony for sunlight. 33% of women gets sunlight by going to terrace. 11% of women manage to get sunlight by visiting parks and 10% of women gets sunlight by opening the curtains of their house.

26 HEALTH ISSUES DUE TO BEING INDOOR

HEALTH ISSUE DUE TO BEING INDOOR	NO	%
YES	42	42.0
NO	58	58.0
TOTAL	100	100

FIGURE 26

From the above figure no 26 we can conclude that how many women have health issues because of being indoor for long time .58% of doesn't have any health issues but 42% of women have health issues due to being indoor.

FOOD FREQUENCY TABLE

Foods items	daily	Weekly once	Weekly twice	Weekly thrice	Monthly
Bajra	8	8	17	13	54
Jowar	6	24	19	12	39
Maize	9	13	17	22	39
Semolina	5	21	23	28	23
Semiya	10	12	28	19	31
Ragi	5	18	21	20	36
Wheatflour	40	8	20	14	18
Green gram dal	9	21	30	26	14
Black gram dal	15	17	30	23	15
Soya bean	14	17	27	28	14
Bathuva	7	15	18	21	39
Cabbage leaves	11	18	24	13	34
Spinach leaves	12	24	24	24	16
Radish leaves	8	18	24	25	25
Beans	23	15	28	22	12
Bitter gourd	6	17	24	29	24

Brinjal	9	19	25	34	13
Cauliflower	12	22	23	30	13
Lady finger	15	13	27	32	13
Mushrooms	12	13	26	35	14
Tomato	58	20	9	10	3
Onion	80	10	5	3	2
Potato	50	15	20	10	5
Orange	16	8	33	30	13
Banana	32	12	24	22	10
Apple	28	14	28	18	12
Grapes	20	9	21	34	16
Guava	10	16	25	30	25
Pomegranate	18	19	16	28	19
Egg	27	11	28	20	14
Chicken	15	16	28	28	13
Fish	12	16	25	22	25
Goat	5	19	20	26	30
Skimmed milk	34	12	25	13	16
Curd	26	11	27	27	9
Sunflower oil	24	8	27	24	17
Mustard oil	30	11	23	21	15
Edible sugar	42	4	20	22	12
Honey	21	11	24	25	19
Jaggery	23	8	20	19	30

India is a diverse country in terms of dietary patterns so, Food frequency questionnaire (FFQ) is a preferred tool for longitudinal dietary assessment. This study demonstrated the the food consumption of women population of Delhi. Standardization was achieved for staple food contributing to a majority of the variance in energy and nutrient intakes.the creation of a reliable databes for a staple indian foods from north india.The food frequency table was developed for the assessment of nutrient intake among housewife in Delhi was easy to administer their dietary pattern.

From the above food frequency table it states that pulses consumption is moderate among the housewives of Delhi. Daily consumption of bajra is 8%, whereas another 8% of women consume bajra once in a week,17% of women include bajra in their diet twice in a week ,13% of women add bajra in their food thrice ina week and 54% of women consume it on monthly basis. jowar consumption is 6% daily,whereas 24% of women consume jowar once in a week , 19% of women include jowar twice in a week ,12% of women add jowar in their diet thrice in a week and 39% of women add jowar in their diet on monthly basis.5% of women population intake ragi daily, 18% of women consume ragi once in a week,21% of women include ragi in their food twice in a week,20% of women add ragi in their food thrice in a week and 36% of women consume ragi on monthly basis only. 9% of women consuming green gram dal per day,21% of women include green gram dal in their diet once in a week , 30% of women consume green gram dal twice in a week whereas 26% of women intake green gram dal thrice in week and 14% of women include it monthly only. black gram dal consumed by them is 15%, 17% of women consuming black gram dal weekly once,30% of women intake black gram dal twice in week ,23% of women eat black gram dal

thrice in a week and 15% of women add black gram dal in their diet monthly only. 15% of women consuming soya bean daily, 17% of women intake soya bean weekly once, 30% of women add soya bean in their diet twice in a week, 23% of housewives consume soya bean thrice in a week and 15% of women add soya bean in their diet on monthly basis.

Majority of women population intake cereals like wheat flour is consumed by the women is 40% daily, 8% of women include wheat flour in their diet weekly once, 20% of wheat flour is added by the housewives are twice in a week, 14% of women consume wheat flour thrice in a week, 18% of women have wheat flour on monthly basis. 9% of maize daily by the women, 13% of women consume maize weekly once, whereas 17% of women intake maize twice in a week, 22% of women add maize in their diet thrice in a week and 39% of women consume maize on monthly basis. semolina 5%, 21% of women consume semolina weekly once, 23% of women include semolina in their diet twice in a week, 28% of women intake semolina thrice in a week and 23% of women consume semolina on monthly basis. 10% of semiya is consumed by women daily, 12% of women have semiya weekly once, 28% of women include semiya weekly twice, 19% of women include semiya in their diet thrice in a week and 31% of women consume semiya monthly.

Green leafy vegetables contain calcium, which helps in absorption of vit-d in our body so green leafy vegetables are very essential. Out of all the green leafy vegetables spinach leaves are included by them in majority that is, 12% of spinach leaves daily, 24% of women eat spinach leaves once in a week, another 24% of women have spinach twice in a week, another 24% of women include spinach in their diet thrice in a week and 16% of women eat spinach leaves on monthly basis. 11% of cabbage leaves included by them, 18% of cabbage leaves are consumed by the women weekly once, 24% of cabbage leaves are included by the women twice in a week, 13% of cabbage leaves are added by the women thrice in a week and 34% of cabbage leaves are included by them on monthly basis. 8% of women consume radish leaves daily, 18% of women include radish leaves in their food once in a week, whereas 24% of women eat radish leaves twice in a week, 25% of women add radish leaves thrice in a week and another 25% of women consume radish leaves on monthly basis. 7% bathuva daily, 15% of bathuva is consumed weekly once, 18% of bathuva is added in their diet weekly twice, 21% of bathuva consumed by women is thrice in a week and 39% of bathuva include in their diet is on monthly basis.

Under Other veg food group 58% of daily consumption is tomato, 20% of women consume tomato once in a week, 9% of women add tomatoes in their diet twice in a week, 10% of women intake tomato thrice in a week and 3% of women include tomatoes monthly. Beans is included in their diet by 23% daily, 15% of women add beans in their diet once in a week, 28

5 of women intake beans thrice in a week. 22% of women consume beans thrice in a week and 12% of women have beans monthly. Lady finger is added in their daily diet is 15%, whereas 13% of women include lady finger once in a week, 27% of women add lady finger in their food twice in a week, 32% of women add lady finger thrice in a week and 13% of women intake lady finger monthly. Daily consumption of mushroom by women is 12% whereas 13% of women consume mushroom once in a week, 26% of mushroom added by women is twice in a week, 35% of women consume mushroom thrice in a week and 14% of women intake mushroom monthly. Cauliflower consumption by women is 12% on daily basis, 22% of women consume cauliflower once in a week, whereas 23% of women include cauliflower in their food twice in a week, 30% of women eat cauliflower thrice in a week, 13% of women have cauliflower in their diet monthly only. Consumption of bitter melon is 6% daily, 17% of women consume bitter melon once in a week, 24% of women add bitter melon in their food twice in a week, 29% of women intake bitter melon thrice in a week and 24% of women intake bitter melon on monthly basis. 9% of women consume brinjal daily, 19% of women intake brinjal once in a week, 25% of women add brinjal twice in a week, 34% of women include brinjal in their diet thrice in a week and 13% of women intake brinjal on monthly basis.

Roots & tubers are majorly consumed by them which includes foods like onion & potato. Onion is the highest consumed food among all, that is 80% of women consume onion daily, 10% of women consume onion once in a week, 5% of women intake onion twice in a week, 3% of women have onion in their food thrice in a week and 2% of women eat onion on monthly basis. 50% of women consume potato daily whereas 15% of women include potato in their diet once in a week, 20% of women add potato twice in a week, 10% of women intake potato thrice in a week and 5% of women consume potato on monthly basis.

Fruits are also important in aspect of vit-d. Some fruits are naturally rich in vit-d and vit-d is automatically generated by the body when skin is exposed to sunlight. 28% of apple is consumed daily, 14% of apple is included in their diet weekly once, another 28% of apple intake by women is twice in a week, 18% of apple consumption by women is weekly thrice and 12% of apple is added by women on monthly basis. Banana is the second most fruit consumed by women. 32% of women include banana in their diet, whereas 12% of women consume banana weekly once, 24% of women have banana weekly twice, 22% of women include banana thrice in a week and 10% banana is consumed by women on monthly basis.

Orange is rich in vit-c, 16% of women include orange on daily basis, whereas 8% of women eat orange weekly once, 33% of women consume orange weekly twice, 30% of women include orange thrice in a week and 13% of women consume orange monthly. Guava consumption by women is 20% on weekly terms, whereas 9% of women consume guava weekly once, 21% women have guava weekly twice, 34% of women eat guava thrice in a week and 16% of women intake guava monthly. Pomegranate is one of the expensive fruit, which is consumed daily by housewives of Delhi is 18%, where 19% of women consume pomegranate weekly once, even 16% of women consume pomegranate twice in a week, 28% women include pomegranate thrice in a week and 19% of women include monthly. 20% of Grapes are included daily by women living in Delhi, whereas 9% of women consume grapes weekly once, 21% of women include grapes in their food is weekly twice, 34% of women have grapes thrice in a week and 16% of women intake grapes on monthly basis.

Under meat and products it include egg, chicken, fish and goat. Egg is easily available and cheapest non veg food item which can be easily cooked and consumed by everyone. 27% of women consume egg on daily basis, whereas 11% of women include egg in their diet weekly once, 28% of women have egg twice in a week, 20% of women consume egg thrice in a week and 14% of women include egg on monthly basis. Chicken is the second most consume non-veg by everyone so 15% of women consume chicken every day, 16% of women include chicken once in a week, 28% of women have chicken twice in a week, whereas another 28% of women include chicken in their diet thrice in a week and 13% of women consume chicken monthly only. Only 12% of women consume fish daily, 16% of women include fish in their diet weekly once, 25% of women have fish twice in a week, 22% of women consume fish thrice in a week and 25% of women eat fish monthly only. Goat is the lowest consumed food by women, 5% of women consume goat weekly, 19% of women consume goat weekly once, 20% of women include consumption of goat twice in a week, 26% of consume goat thrice in a week and 30% intake goat on monthly basis only.

under milk and milk product, curd is consumed by 26% of housewives, whereas 11% of women consume curd weekly once only, 27% of women include curd in their diet twice in a week, another 27% of women eat curd thrice in week and 9% of women consume curd monthly. consumption of skimmed milk my house of Delhi is 34% daily, whereas 12% of skimmed milk included by women is weekly once, 25% of women consume skimmed milk twice in a week, 13% of women consume milk thrice in a milk and 16% of women include skimmed milk on monthly basis.

Under fats, sunflower edible oil is consumed by women is 24% daily, 8% of women use sunflower oil weekly once, whereas 27% of women add sunflower oil twice in a week, 24% of women consume sunflower oil thrice in a week and 17% of women intake sunflower oil on monthly basis. Mustard oil is mostly used in northern part of India, they include mustard oil while cooking. 30% of women include mustard oil daily, 11% women add mustard oil once in a week, 23% of women include mustard oil twice in a week, 21% of women consume mustard oil thrice in a week and 15% women add mustard oil on monthly basis.

Under sugar edible sugar, honey and jiggery has been included. 42% of women consume Edible sugar. whereas only 4% of women consume it weekly once, 20% of women include edible sugar in their food twice in a week, 22% of women intake edible sugar thrice in a week and 12% of women consume it on monthly basis.

II. CONCLUSION

The conclusion of the study entitled “**PREVALENCE OF VITAMIN-D DEFICIENCY AMONG HOUSEWIFE IN DELHI**”.

Age distribution of the selected sample states that majority 27% of samples were 30 years of aged housewives. Among the selected sample minimum age group of housewife participated was 1 women aged 21.

Height distribution of selected sample states that majority 27% of women belongs to 160cm and lowest among them is 5% of women having 190cm of height. the weight distribution of selected samples 33% of women has 55kg of weight whereas 8% of women has 45kg of weight.

Among 100 selected samples 84% of women knows what is vitamin-d deficiency whereas rest of 16% of women doesn't know what vitamin-d deficiency is, so majority of them are aware of vitamin-D deficiency and some of them need to be aware of vitamin-d deficiency. 84% of women thinks that exposure to sunlight is necessary in this pandemic to boost our immunity and 14% of women doesn't feel so.

Many women has conveyed their view on importance of vitamin-D in our body. 26% of women feel that vitamin-D is important in our body to keep our bones strong, whereas 12% says it is required for calcium absorption and 3% believe that it required by our body to work with parathyroid gland and 55% says it is importance for all the above reasons.

As we know that how vital is sunlight for us, only 14% of women says that low exposure to sunlight may lead to vitamin-D deficiency whereas 86% of women don't feel like that. when checked with the health status of housewife in Delhi. came to know that among 100 women only 12% of women had excellent health, while 36% of women has good health status and 52% of women has poor health status. when asked them about maintain their health. how many of them do exercise, only 43% women exercise and 57% of women doesn't practice exercise at all. 23% of women only exercise daily and 52% of women never exercise. when asked them about what kind of physical activity they perform 38% perform indoor exercise and 15% go for outdoor activity whereas 47% doesn't go for anything. 24% of them perform yoga, 15% of women does terrace gardening, 17% of women go for workout at terrace and 44% of them don't do anything.

53% of women are aware about the combination of calcium and vitamin-D rich food together and 47% of women are not even aware of it. When asked what kind of calcium rich food they consume, came to know that 49% of women consume milk and milk products, whereas 12% of women include fishes, 14% of women intake green leafy vegetables in their diet and 9% of women add soya in their food as a source of calcium. 71% of women believe relation between calcium, sunlight and bone strength and 29% of women doesn't feel like that.

Vitamin-D rich foods are also available. Among selected samples, 32% of women consume fatty fishes as a source of vitamin-D rich food, 24% of women consume egg yolk and 7% of women include red meat as a source of vitamin-D. Being at home 53% of women intake vitamin-D from sunlight, 11% of women intake vitamin-D through food, 10% of women intake vitamin-D through supplements. 33% of women apply sunscreen on their body and 67% of doesn't apply sunscreen. 53% of women are facing symptoms of vitamin-D deficiency. 47% of women don't have any symptoms of vitamin-D deficiency. 17% of women have muscle weakness and pain, 16% of women have body pain, 4% of women have mood change such as

depression and 4% of women has fatigue.27% of women are done with bone mineral density test and 73% of didn't go for test.

65% of women consume vitamin-D supplement and 35% of women doesn't take vitamin-D supplement.55% of women have severe vitamin-D in their body,10% women have moderate vitamin-D deficiency and 9% of women have low vitamin-D condition.among 100 selected samples 36% of women consume medicines for vitamin-D deficiency and 64% of women doesn't consume medicine for vitamin-D deficiency.

Sunlight is the best source of vitamin-D .before 12pm is considered to be a best time for getting sunlight.63% of women sit under sun before 12 , whereas 11% of women intake sunlight after 12 and 15% of women consume vitamin-D between 11am-3pm.among 100 housewives only 10% of women sit under sun for 2hrs to get vitamin-D,21% of women sit under for 1hr, 42% of women takes 15mins to sit under sun and 27% of women sit under sun for 20mins.amidst pandemic no one step out their home , so during pandemic how they managed to get sunlight.46% of women sit in their balcony to get enough sunlight,33% of women goes to terrace to intake sunlight, 11% manage to go parks and get vitamin-d and rest of 10% women open their window and curtain of their room to get sunlight inside their home. Staying indoor puts a lot of pressure on the body as well as mind. many people faced health issue being indoor for long time in this pandemic. Around 42% of women faced health issues due to being indoor and 58% of women were well and good.

Food frequency questionnaire was used to assess the nutrient intake across the women population in Delhi. As per going through the food frequency questionnaire came to know that 8% of women consume bajra daily,6% of women include jowar daily in their diet,9% of women have maize daily, only 5% of women include semolina and 10% of women add semiya in their food. only 5% of women consume ragi, whereas 40% of women intake wheat flour daily, 9% of women population consume green gram dal and 15% of women add black gram dal in their diet,14% of women consume soya bean .among green leafy vegetables daily consumption of is bathuva is 7% whereas 11% of women include cabbage leaves in their diet,12% of housewife add spinach leaves in their food and 8% of the include radish leaves in their food.

Among the selected sample 23% of women consume beans daily,only 6% of women intake bitter gourd in their food,9% of them add brinjal in their diet ,12% of women consume cauliflower,15% of women intake ladyfinger ,12% of women add mushroom in their food and 58% of women consume tomato in their food daily.80% of women consume onion daily and 50% of them have potato in their food daily.

Fruits are also important in aspect of vit-d. Some fruits are naturally rich in vit-d and vit-d is automatically generated by the body when skin is exposed to sunlight.16% of women consume orange daily , 32% of women include banana in their diet daily,28% of them eat apple daily,20% of women daily intake grapes,10% of women have guava per day, pomegranate being the expensive fruit 18% of women consume it on daily basis.

Under meat and products it include egg, chicken, fish and goat. Egg is easily available and cheapest non veg food item which can be easily cooked and it is consumed by 27% of women,15% of women add chicken daily in their diet, 12% of women intake fishes daily and only 5% of women include goat that mutton in their food daily.

34% of women intake skimmed milk daily and 26% of women have curd daily.24% of women add curd in their food daily,30% of women consume mustard oil daily, whereas 42% of women eat edible sugar daily,21% of them consume honey daily and 23% of housewife intake jiggery daily.

Our study reports a very high prevalence of vitamin-D Deficiency among housewives in Delhi. It is the need of time to increase awareness regarding the health benefits, sources, deficiency symptoms of vitamin-D deficiency. Daily sun exposure to sunlight must be encouraged .ICMR should also revise the recommended daily allowance to include daily recommendation of vitamin-D level. Daily physical activity in sunshine should be included. Government of india should take steps for the fortification of staple food with the vitamin-D and also make effort so that the vitamin-D supplements should be available at affordable costs. State must organize programs to create awareness on vitamin-D deficiency among women.

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