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"A Study to Assess the Effectiveness of Information Booklet on Knowledge Regarding Vitamin D Deficiency on Health Among Working People in Selected Area".

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Abstract

Background: Vitamin D deficiency is a widespread public health concern that affects individuals across all age groups, particularly working people who spend long hours indoors with limited exposure to sunlight. Deficiency of Vitamin D can lead to various health problems, including weakened bones, muscle weakness, fatigue, and an increased risk of chronic diseases.

Objective: The study aimed to assess the effectiveness of an information booklet on knowledge regarding Vitamin D deficiency and its impact on health among working people in a selected area.

Methods: A quantitative research approach was adopted for the study. Two group Pre Test Post Test design was used. 200 samples were selected using convenient sampling technique. Baseline knowledge regarding Vitamin D deficiency was assessed using a structured questionnaire. Following the pre-test, participants received an information booklet containing details about the causes, risk factors, symptoms, complications, prevention, dietary sources, and importance of sunlight exposure for maintaining adequate Vitamin D levels. A post-test was conducted after the intervention to evaluate changes in knowledge. Descriptive and inferential statistics were used to analyze the data.

Result: The findings demonstrated a significant improvement in participants' knowledge scores after exposure to the information booklet. The mean post-test knowledge score was higher than the mean pre-test score, indicating that the educational intervention was effective.

Conclusion: The information booklet proved to be an effective educational tool for improving knowledge regarding Vitamin D deficiency among working people. Regular health education programs and awareness campaigns can help promote preventive behaviors, encourage healthy lifestyle practices, and reduce the burden of Vitamin D deficiency in the working population.

Keywords: Assess, Effectiveness, Infromation Booklet, Vitamin D Deficiency, Working People.

Introduction

The role of vitamin D in human health and disease, as well as the potential benefits of improving vitamin D status for both skeletal and numerous non-skeletal health outcomes, have garnered extraordinary attention over the past ten years. The robustness of the evidence supporting the importance of vitamin D has been the subject of disagreements and, in certain cases, contentious dispute during the same period.[1]

According to all epidemiological research, vitamin D insufficiency is common in the Polish general population. We updated the previous Polish recommendations due to worry about vitamin D insufficiency, which has been demonstrated to be one of the risk factors for numerous diseases and for all-cause death.[2]

Calcium and phosphorus balance, as well as the preservation of bone tissue, depend on vitamin D (VD). The human body is covered in its receptors, suggesting that it serves a variety of purposes. Since endogenous synthesis is the primary cause of body VD, it is now more frequently regarded as a hormone than a vitamin in the strict sense.[3]

It's well knowledge that "getting some sun" boosts the creation of vitamin D. The precise levels of UV radiation exposure that minimize the danger of skin cancer while achieving the beneficial effects of elevated serum vitamin D are less well understood. Through a variety of processes, vitamin D promotes tissue repair, inhibits dangerous inflammatory mediators, and stops the growth and spread of many types of cancer. Exposure to ultraviolet light can readily synthesize endogenous vitamin D. Serum vitamin D levels can also be safely raised with vitamin D supplements, though not as quickly or efficiently as with sunlight. Vitamin D can be produced with very little exposed skin.The prognosis of some systemic disorders is improved by maintaining greater serum vitamin D levels, however it is challenging to calculate the required amount because of factors affecting absorption.[4]

Fat-soluble vitamin D is a hormone that is produced by the skin when exposed to sunshine (90%) and food (10%) [1,2]. 7-dehydrocholesterol (pro-vitamin D3), which is produced by the liver from cholesterol, is the precursor of vitamin D. It is first transformed into pre-vitamin D3 and subsequently into cholecalciferol (vitamin D3) in the skin by solar energy under the influence of UV light. Age, ethnicity, skin pigmentation, seasonal variations in sunlight, latitude, daytime and duration of sun exposure, exposed skin area, use of sunscreen, and clothing all affect the body's natural production of vitamin D.Ergocalciferol (vitamin D2) and cholecalciferol, which are abundant in naturally rich animal foods like eggs, cod liver oil, and fish fat like salmon, sardines, mackerel, and tuna , as well as some fortified foods like milk, juices, and cereals, make up the dietary source.[5]

A significant global public health issue is vitamin D (VD) insufficiency. Many doctors continue to underestimate VD deficiency despite its significant prevalence, especially among the elderly. VD insufficiency is increasingly linked to a number of recognized geriatric diseases.[6]

Background of the Study

Osteomalacia, a human bone hypomineralization illness, is brought on by vitamin D insufficiency, which is also linked to a number of non-skeletal conditions. Our goal is to calculate the prevalence of vitamin D deficiency in individuals one year of age or older, both globally and regionally, between 2000 and 2022.[7]

Numerous disorders are closely linked to vitamin D deficiency. Finding those who are at high risk of vitamin D insufficiency is crucial in light of the present global vitamin D deficiency pandemic. This work intends to apply machine learning to forecast the risk of vitamin D insufficiency using data that can be gathered through straightforward community interviews, as there are currently no prediction tools available for predicting the risk of vitamin D deficiency in the broad community population.[8]

The results of the 5th International Conference "Controversies in Vitamin D," which took place in Stresa, Italy, from September 15–18, 2021, are presented in this publication. The conference is a part of this annual series that began in 2017. Finding current and contentious vitamin Drelated subjects is the aim of these conferences. One crucial way to provide doctors, researchers, and other medical professionals with the most recent information is by publishing the conference's findings in peer-reviewed journals. This paper's topic, vitamin D and aging, was highlighted during the conference.[9]

A prevalent worldwide health issue, vitamin D insufficiency has been extensively researched in relation to immune system performance and infectious illnesses. Numerous immune cells contain vitamin D receptors, indicating a possible correlation between immunological-related characteristics and vitamin D levels. However, there is still a dearth of comparative observational data analyzing age-related variations in immunological markers and infection patterns among people with vitamin D deficiency.[10]

Because vitamin D deficiency is linked to poor maternal and newborn outcomes, it is an increasing global health concern, especially among pregnant women. Due to its significant ethnic diversity and financial disadvantage, Birmingham's population is particularly high-risk and may be more susceptible to low vitamin D levels. The purpose of this study was to ascertain the prevalence of vitamin D deficiency among expectant mothers receiving prenatal care at a sizable tertiary hospital and to assess the effectiveness of risk-based screening in identifying those who are deficient.[11]

Shwetha M. N, Nancy Chandra Priya. P.(2019) conducted study on Knowledge regarding vitamin D deficiency among students to assess the knowledge regarding vitamin D deficiency among students in selected college. A self-structured knowledge questionnaire on vitamin D deficiency was developed to collect the data for the present study. The reseach was conducted at St. Martha's college of nursing, Bengaluru among 58 students. Non-probability purposive sampling technique was used for selection of samples and the data was analyzed and interpreted by using descriptive and inferential statistics. An information pamphlet was distributed among students. The result of the study revealed that 41.38 % have adequate knowledge, 55.18% have moderate knowledge, and 3.44% have inadequate knowledge regarding vitamin D deficiency. The data analysis regarding association between knowledge score with selected demographic variables revealed that there is no association between knowledge score with selected baseline variables such as age, religion, monthly income, exercise, time spend outdoor, source of information, dietary pattern, use of sunscreen, , previous history with vitamin D deficiency. The study concluded that the results of this study that students have moderate knowledge regarding vitamin D deficiency. [12]

Objectives

1. To assess the level of knowledge regarding vitamin D deficiency on health of working people in selected area.
2. To evaluate the effectiveness of information booklet on knowledge regarding vitamin D deficiency among working people in selected area.
3. To find out the association of knowledge with selected demographic variables.

Materials And Methods

Study Design: Quasi Experimental Two Group Pre Test Post Test design was used for this study.

Study Setting: Both, the urban & the rural community were utilized as study settings for this study.

Sample Size and Sampling Technique: A total of 200 working people were selected using non - probability convinient sampling technique based on inclusion & exclusion criteria.

Sampling Criteria:

Inclusion criteria

- ❖ Workers who were willing to participate
- ❖ Working people who are available during the period of data collection

Exclusion criteria

- ❖ Individuals not willing to participate
- ❖ Individuals who already have detailed knowledge about vitamin D deficiency

Hypothesis

H_0: There is no significant difference between pretest and post test knowledge regarding Vitamin D deficiency on health among working people in selected area.

H_1 : There is a significant difference between pretest and post test knowledge regarding Vitamin D deficiency on health among working people in selected area.

Ethical Aspects

Permission taken from the authorities before starting te research. All samples were explained the purpose of the study and their consent was obtained.

Demographic Variables :

Section A: It consists of semi-structured questionnaire to collect demographic data.

Section B: Self-Structured Knowledge Questionnaires.

Results

Section I – Distribution of Samples based on Demographic Variables n=200

Demographic Variables	Number of Working People	Percentage (%)
Age(years)		
21-25 years	66	33.00
26-35 years	65	32.50
36-45 years	48	24.00
46 years & above	21	10.50
Gender		
Male	118	59.00
Female	82	41.00
Transgender	00	00
Education		
No formal education	21	10.50
Primary education	54	27.00
Secondary education	65	32.50
Graduation Education	60	30.00
Type of Occupation		
Business	66	33.00
Self-employment	65	32.50
Private sector	48	24.00
Other	21	10.50
Religion		
Hindu	93	46.50
Muslim	63	31.50
Christian	18	09.00
Buddhist	26	13.00

Other	00	00
Family income		
50001 – 15000k	64	32.00
15001 – 25000k	71	35.50
25001 – 35000k	42	21.00
More than 35001k	23	11.50
Type of Family		
Nuclear family	86	43.00
Joint family	78	39.00
Extended family	36	18.00
Living Area		
Rural	99	49.50
Urban	101	50.50
Working hours Per Day		
Less than 6 hr	47	23.50
6-8 hr	86	43.00
More than 8 hr	67	33.50
Dietary Pattern		
Veg	86	43.00
Non Veg	78	39.00
Mixed	36	18.00
Working Environment		
Indoor	98	49.00
Outdoor	102	51.00

Section – II Effectiveness of Information Booklet on Vitamin D Deficiency on Health.

Table 2: Significance of knowledge score regarding vitamin D deficiency on health of People before and after Information booklet. n=200

Overall	Maximum score	Mean	Standard deviation	Mean percentage	t-value	p-value
Pre Test	14	7.66	2.20	30.64	47.84	0.000 S, p<0.05
Post Test	25	18.75	2.43	75.00		

(S = Significant at 0.05 level of significance)

Table 2, shows that in the pretest the mean of the knowledge score obtained by the people was 7.66 and in the post test it increased to 18.75. The knowledge score of the people showed marked improvement after giving Information booklet. From the above table, it is evident that the calculated 't' value was greater than the table value of 't' at 0.05 level. This indicates that Information booklet was effective in improving the knowledge of the people regarding vitamin D deficiency on health.

SECTION II: Assessment Of Knowledge Score Of Vitamin D Deficiency On Health Among People.

Table 3: Assessment of Knowledge score of People regarding vitamin D deficiency on health before giving Information booklet. n-200

Domain	Maximum score	Mean	Standard deviation	Mean percentage
Knowledge score	14	7.66	2.20	30.64

The above table 3 showed that the in pretest mean knowledge score regarding vitamin D deficiency on health among People was 7.66. It indicates that, people were having average knowledge in pretest.

Table 4: Assessment of Knowledge score of People regarding vitamin D deficiency on health after giving Information booklet. n =200

Domain	Maximum score	Mean	Standard deviation	Mean percentage
Knowledge score	25	18.75	2.43	75.00

The above table 4 showed the in posttest mean knowledge score regarding vitamin D deficiency on health among People was 18.75. It indicates that, people were having excellent knowledge in posttest.

SECTION III: Evaluate The Effectiveness Of Information Booklet On Vitamin D Deficiency On Health.

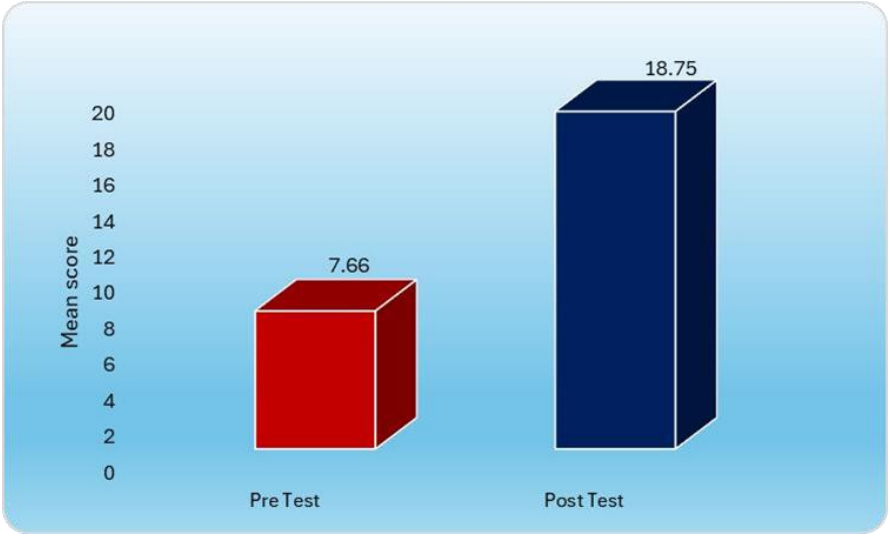

Figure 1: Significance of knowledge score regarding vitamin D deficiency on health of People before and after Information booklet.

The above fig no. 1 showed that in the pretest the mean of the knowledge score obtained by the people was 7.66 and in the post test it rise to 18.75. The knowledge score of the people shows marked improvement after giving

Information booklet. From the above table, it is evident that the calculated 't' value was greater than the table value of 't' at 0.05 level. This indicates that Information booklet was effective in improving the knowledge of the people regarding vitamin D deficiency on health.

Section Iv:Level Of Knowledge Score Of People In Pre And Post Test

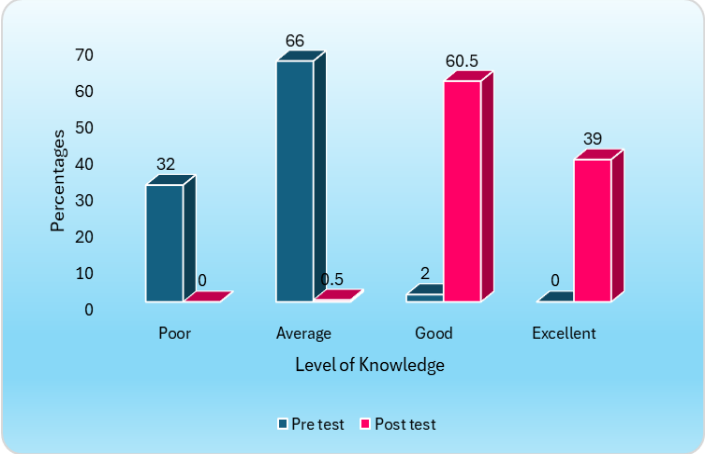

Figure 2: Distribution of People with regards to general assessment

The above fig no. 2 showed that, In pretest 32 % of the people had poor level of knowledge score, 66 % had average level of knowledge score. In posttest 60.50 % of the people had good level of knowledge score and 39 % had excellent level of knowledge score. The difference between pretest and posttest level of knowledge score was found to be statistically significant (χ^2-value= 164.75).

SECTION- V: Association Of Knowledge Score Of People In Relation To Demographic Variables

Table 5: Significance of difference of Pretest knowledge on vitamin D deficiency on health in relation to age. n=200

Age (yrs)	**No. of People**	**Pre test knowledge**	**F-value**	**p-value**
21-25 years	66	7.51 ± 2.15	0.51	0.67 NS, p>0.05
26-35 years	65	7.60 ± 2.20		
36-45 years	48	8.00 ± 2.38		
46 years & above	21	7.52 ± 2.04		
Gender	**No. of People**	**Pretest knowledge**	**t-value**	**p-value**
Male	118	7.59 ± 2.21	0.26	0.60 NS, p>0.05
Female	82	7.75 ± 2.22		
Transgender	00	00		
Education	**No. of People**	**Pre test knowledge**	**F-value**	**p-value**
No formal education	21	7.76 ± 2.64	1.29	0.27 NS, p>0.05
Primary education	54	7.64 ± 2.10		

Secondary education	65	7.27 ± 2.04		
Graduation Education	60	8.05 ± 2.29		
Type of ccupation	**No. of People**	**Pre test knowledge**	**f-value**	**p-value**
Business	66	7.51 ± 2.15	0.51	0.67 NS, p>0.05
Self-employment	65	7.61 ± 2.20		
Private sector	48	8.00 ± 2.38		
Other	21	7.52 ± 2.04		
Religion	**No. of People**	**Pre test knowledge**	**F-value**	**p-value**
Hindu	93	7.61 ± 2.11	1.92	0.12 NS, p>0.05
Muslim	63	8.00 ± 2.42		
Christian	18	7.94 ± 2.31		
Buddhist	26	6.80 ± 1.74		
Other	00	00		
Family income	**No. of People**	**Pre test knowledge**	**F-value**	**p-value**
50001 – 15000k	64	8.06 ± 2.36	3.10	0.02 S, p<0.05
15001 – 25000k	71	7.32 ± 2.21		
25001 – 35000k	42	8.09 ± 1.93		
More than 35001k	23	6.78 ± 1.85		
Type of Family	**No. of People**	**Pretest knowledge**	**F-value**	**p-value**
Nuclear family	86	7.77 ± 2.19	0.67	0.50 NS, p>0.05
Joint family	78	7.70 ± 2.23		
Extended family	36	7.27 ± 2.18		
Living Area	**No. of People**	**Pretest knowledge**	**t-value**	**p-value**
Rural	99	7.63 ± 2.11	0.02	0.88 NS, p>0.05
Urban	101	7.68 ± 2.31		
Working hours Per Day	**No. of People**	**Pretest knowledge**	**F-value**	**p-value**

Less than 6 hr	47	7.36 ± 1.91	0.66	0.51 NS, p>0.05
6-8 hr	86	7.82 ± 2.20		
More than 8 hr	67	7.65 ± 2.40		
Dietary Pattern	**No. of People**	**Pretest knowledge**	**F-value**	**p-value**
Veg	86	7.77 ± 2.19	0.67	0.50 NS, p>0.05
Non Veg	78	7.70 ± 2.23		
Mixed	36	7.27 ± 2.18		
Working Environment	**No. of People**	**Pretest knowledge**	**F-value**	**p-value**
Indoor	98	7.67 ± 2.08	1.38	0.25 NS, p>0.05
Outdoor	102	7.68 ± 2.31		

5. Discussion

lkubur, A., Boubaid, J., Alghazal et al. conduceted study with aimed to assess the knowledge, attitude and practice of vitamin D deficiency among adults in Saudi Arabia. The observational cross-sectional study conducted among adults aged 18 and above at Saudi Arabia by Knowledge, attitude and practice (KAP) regarding vitamin D questionnaire it consistent of 47 questions and divided into 5 sections: demographic information, general knowledge, nutrition knowledge, attitude and practice, it was sharing among the adults aged 18 and above in Saudi Arabia. A total of 377 Saudi adults from different regions participated in this study. The result of the study showed that the knowledge, attitudes and practices regarding vitamin D deficiency among 383 adults in Saudi Arabia. The findings of the study revealed that while 87.7% recognized the risks of indoor work and 86.9% acknowledged the elderly's vulnerability, only 8.9% demonstrated high nutritional knowledge about vitamin D. The study revealed that the significant 54.8% attributed urbanization to limited sun exposure, with 91.2% acknowledging the challenges faced by indoor workers. Despite high general knowledge levels (63.7%), only 30.5% exhibited strong practices related to vitamin D intake. Notably, educational level significantly influenced both knowledge and attitudes, highlighting the need for targeted public health interventions. The study concluded that the a commendable level of general knowledge about vitamin D among adults in Saudi Arabia, it also underscores significant gaps in nutritional awareness and practical application of this knowledge.[13]

6. Conclusion

The study was conducted to assess the effectiveness of an information booklet on knowledge regarding vitamin D deficiency among working people in a selected area. A pre-experimental two group pre-test and post-test design was used, and 200 participants were included in the study. The pre-test findings revealed that most participants had average and poor knowledge about vitamin D deficiency. After administering the information booklet, the post-test showed a significant improvement in knowledge levels, with most participants achieving good to excellent knowledge. The mean score increased from 7.66 to 18.75, and the result was statistically significant ($p < 0.05$). The study also found that family income had a significant association with knowledge levels, while other demographic variables showed no significant association. The study concluded that the information booklet was highly effective in improving knowledge regarding vitamin D deficiency among working people, highlighting the importance of health education in disease.

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Conflict of Interest

The authors declare no conflict of interest.

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