

## **Calcium And Vitamin D Knowledge Of College Girls For Women Bone Health: A Study Of Patna District, Bihar**

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### **Abstract**

*Present study deals with the knowledge of college girls on calcium and vitamin D for good bone health of women. The study was conducted in four colleges of Patna district, Bihar. Out of four colleges, two colleges were selected from rural Patna and two colleges were selected from Patna Sadar. 150 female students studying at undergraduate or post graduation level were selected from each college. Thus sample size comprised of 600 respondents. Selection of respondents was done through purposive convenience sampling technique. Data was collected through a schedule which was self structured. There are 7 questions on knowledge of calcium and vitamin D. Knowledge regarding sources of calcium and vitamin D demonstrate that 45.33 % respondents know only one source of calcium, 22.67 % know more than one sources and 21.0% do not know any source. However 62.50 % respondents know only one source of vitamin D and only 6.17 % respondents know more than two sources while 19.0 % do not know any source of vitamin D. Again only 17.83 % respondents know calcium requirement of adult woman and 5.50 % respondents know vitamin D requirement of adult woman. Further results of the study unfurl that 33.83 % respondents know the duration of sun exposure to meet vitamin D and 52.17 % respondents answer duration of sun exposure incorrect. Furthermore 26.83 % respondents know that use of sun screen reduces absorption of vitamin D. Regarding knowledge level 51.50 % respondents have moderate level knowledge and 43.50 % possess low knowledge level on calcium and vitamin D. However only 5.00 % respondents fall under high knowledge level category. The study further discovers that knowledge level of the respondents is significantly associated with age, education level of the respondents, education of mothers, occupation of mothers, income level of family and locality of the college (p-value .001) while knowledge level is not significantly associated with caste (p-.058).*

**Keywords:** *Assessment, college girls, knowledge, moderate, self-structured*

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### **I. Introduction**

Women bone health is crucial and important for overall health. As bone is responsible not only for structural framework of the body but perform many other important functions as well. Unfortunately, bone related health problems are increasing very sharply not only in India but all over the world. The problem of poor bone health is comparatively more common among female population. Severity of the problem can be understood with the given data which says that approximately 50 million people in India have either osteoporosis or osteopenia, with a greater prevalence among men and postmenopausal women. Like other non-communicable diseases (NCDs), osteoporosis and osteopenia are also known to occur at a relatively young age in the Indian population (Chandran, M., 2021).

According to a survey report nearly one out of 5 young adults in India have low bone mass. Women are more likely to get osteoporosis because of thinner bones and sharply decrease in estrogen in menopause (Mishra, 2023).

Poor bone health among women are caused due to several reasons as previous studies also demonstrate the facts. Poor nutrition, specially inadequate intake of calcium, vitamin D and proteins during early stage affect peak bone mass. This affects women's bone strength and bone mass density in later stage. Furthermore female have shorter and thinner bones compared to male which also make them vulnerable for poor bone strength. Again pre and post menopause stage cause reduction in estrogen level among women which makes their bones porous and fragile. Apart from these factors idle life style, smoking, lack of exercise are other reasons of poor bone health. Most of the researches exhibit that majority of population lack awareness and possess low knowledge on needs and dietary sources of calcium and vitamin D. Unawareness and low knowledge toward calcium and vitamin D affect utilization pattern of vitamin D and calcium rich foods in daily diet which makes the situation more alarming.

Present study deals with knowledge assessment of college girls toward calcium and vitamin D for bone health and association between knowledge level and selected socio demographic variables.

#### Need Of The Study

Poor bone health in women is emerging as a serious community problem all over the world. Since most of the studies were carried out on awareness and knowledge of osteoporosis, calcium and vitamin D among specific target groups. Again very few studies are available on awareness and knowledge of calcium and vitamin D among school and college girls. Therefore this study was conducted to assess awareness and knowledge of college girls toward calcium and vitamin D for women bone health. Assessing awareness and knowledge among school and college girls will provide insights to make effective strategies for curbing the future bone health problems among female population.

#### Objectives Of The Study

- 1.To assess knowledge of the respondents on calcium and vitamin D for women bone health .
- 2.To analyse association between knowledge level and selected socio- demographic variables.

#### Hypotheses

- 1.Respondents possess low knowledge level on calcium and vitamin D for women bone health.
- 2.Knowledge level of the respondents toward calcium and vitamin D is significantly associated with selected socio-demographic variables.

## II. Review Of Literature

Sham et al.(2013) in their study recommended that intervention programs should be adopted to increase the knowledge among young adults to improve their health and prevent risk factors. Their study further suggested that health education specifically on calcium intake would be very useful to improve the knowledge and behavior of the students.

Akhter et al.(2013) studied Calcium and Vitamin D Related Knowledge among( 16-18 Years) old adolescents residing in rural and urban areas of Dhaka ,Bangladesh . Findings of the study discovered that majority of participants had adequate knowledge about main source/dietary source of vitamin D, the site of synthesis, effect of vitamin D on bone health, main effects of deficiency on bone health, identification of high-risk groups and importance of supplements in management of deficiency. However, majority had inadequate knowledge about the epidemic state of VDD, RDA, time/duration of sun exposure and other effects of deficiency.

Thus, the study reported that there were some gaps in awareness about vitamin D, its benefits, and management of deficiency among female medical students.

Kambal et al.(2023) studied vitamin D knowledge, awareness and practices of female students in the Southwest of Saudi Arabia .This was a cross-sectional study and findings of the study explored that the participants had limited knowledge of vitamin D normal level (49.5%) and the recommended daily amount of vitamin D (26.5%).Results of the study also revealed that most of the participants were unaware of its benefits for vision, muscle integrity, weakness, and fatigue but recognized the importance of sunlight for maintaining suitable levels of vitamin D (94.1%). However, only 43.1% identified that decreased intake of foods rich in vitamin D is a cause of vitamin D deficiency.

Furthermore univariate and multivariate logistic regression models demonstrated a significant association between knowledge, and residence and source of information (odds ratios = 3.48 and 2.79, respectively,  $P < .05$ ).

The study further advised to conduct additional research using a reliable grading system, identify knowledge gaps and look into students' perspectives on the approach to raising awareness.

Satha et al.(2022) in their research titled "KNOWLEDGE AND AWARENESS OF OSTEOPOROSIS AMONG 144 YOUNG WOMEN AT CALMETTE HOSPITAL" documented that majority of the participants had known about osteoporosis and friends or family was the most common source of information. Findings of the study also reveal that most of the respondents have a moderately bone-friendly lifestyle. Their calcium source depended largely on green vegetable. The average mean score of knowledge was 9.34 ( $\pm 3.08$ ) (range from 0 to 20). However, half of them worried about suffering of osteoporosis in their later years of life.

Further the study suggests need of educational intervention, such as public awareness programs regarding a bone-friendly lifestyle and osteoporosis screening to sensitize general population about osteoporosis and its complication.

Folasire et.al.(2017) intended their research on Calcium Knowledge and Consumption Pattern of Calcium-rich Foods among Female University Students in South-west Nigeria. Findings of the research showed that there was a low level of knowledge about calcium among the respondents. Further, the study

suggested provision and promotion of adequate calcium knowledge and intake during the formative years and more efforts to impact calcium knowledge amongst adolescents and young adults should be put in place in schools, homes, and in particular through the social media. Efforts to promote consumption of locally available alternative rich sources of calcium should also be intensified in our environment.

Babhulkar et al. (2021) in their retrospective study of 31238 respondents report that nearly one out of two have osteopenia and one out of five have osteoporosis. Further findings again discover that osteoporosis prevalence was higher in the women and in the elderly and nearly one out of three women in postmenopausal age group have osteoporosis.

Furthermore the study emphasizes that there is a need to increase the awareness about bone health in general population.

### III. Research Methodology

#### Selection of locale

The present study was conducted in three blocks of Patna district ,Bihar .These blocks are Patna Sadar ,Bihta and Naubatpur. Two colleges from Patna Sadar, one from Naubatpur and one college from Bihta block were selected purposively for conducting the study.

#### Research design

The study followed a descriptive research design.

#### Sampling technique and sample size

All the four colleges under three blocks were selected purposively for conducting the survey. 150 girls doing graduation / post graduation were selected from each college .Selection was done using purposive convenient sampling technique. Thus total sample size comprised of 600 respondents.

#### Tools for data collection

Data was collected through a schedule . The schedule was developed on the basis of previous studies with some modifications as per requirement of the objectives. There are 11 questions on socio-demographic profiles and 7 questions were asked for knowledge assessment on calcium and vitamin D . One point was assigned to correct answer while 0 was given for incorrect answer. Respondents knowing more than two sources of calcium or vitamin D have been assigned two point and knowing one source received one point .Knowledge was measured in terms of frequency and percentage while knowledge level was assessed on the basis of scores obtained by the respondents .Maximum score obtained by the respondents was 9 and minimum score was 0.

#### Statistical tools

Percentage ,frequency ,pie chart and p -value were calculated to assess knowledge and knowledge level of the respondents.

### IV. Results And Discussion

Table -1.1: Respondents possessing knowledge toward calcium and vitamin D for bone health  
N=600

<b>1.Known sources of calcium</b>		
More than one source	136	22.67
One source	272	45.33
Don't know	126	21.00
No response	66	11.00
<b>2.Calcium requirement is optimum during pregnancy and lactation</b>		
correct	203	33.83
incorrect	99	16.50
don't know	260	43.33
no response	38	6.34
<b>3. An adult woman needs calcium per day</b>		
correct	107	17.83
incorrect	299	49.84
don't know	168	28.00
no response	26	4.33
<b>4.Known source of vitamin D</b>		
More than one source	37	6.17
One source	375	62.50
Don't know	114	19.00
No response	74	12.33

5.An adult woman needs vitamin D per day		
correct	45	7.50
incorrect	336	56.00
Don't know	181	30.17
No response	38	6.33
6.Duration of sun exposure can fulfill vitamin D requirement		
correct	203	33.83
incorrect	313	52.17
Don't know	37	6.17
No response	47	7.83
7.Use of sun screen cream reduces absorption of vitamin D		
correct	161	26.83
incorrect	125	20.83
Don't know	268	44.67
No response	46	7.67

Perusal of table 1.1 shows that 45.33 % respondents know only one source of calcium, 22.67 % know more than one source of calcium followed by 21.0 % who don't know any source while 11 % do not give any reply on source of calcium.

Again answering the question calcium requirement is optimum during pregnancy and lactation, 33.83 % respondents give correct answer and 16.50 % give incorrect answer while 43.33 % respondents do not know the answer .However 6.33 % respondents do not reply to this question.

Further an adult woman needs calcium per day, answering this question only 17.83 % respondents give correct answer 49.83 % respondents give incorrect answer ,28 .00 % say don't know while only 4.33 % do not give any response.

Further 62.50 % respondents know one source of vitamin D , 6.17 % respondents know more than two sources and 19.0% say don't know any source while 12.33 % respondents do not reply if ask about source of vitamin D.

Data pertaining to vitamin D requirement by adult woman exhibits that only 7.5 % respondents know the correct answer while 56.0 % respondents answers are incorrect .However 30.17 % respondents answer don't know and 6.33 % respondents do not give any response.

Regarding duration of sun exposure to fulfil vitamin D requirement 52.17 % respondents' responses are incorrect and 33.83 % give correct replies .Moreover 6.17 % respondents' responses are don't know while 7.83 % respondents do not give any response. Replying the question, use of sun screen cream reduces absorption of vitamin D, 26.83 % respondents give correct answer and 20.83 % answers are incorrect .However 44.67 % respondents say don't know and 7.67 % respondents do not answer.

Findings on recommended daily amount of vitamin D show similar results found by Kambal et al.(2023) who concluded in their study that the participants had limited knowledge of vitamin D normal level (49.5%) and the recommended daily amount of vitamin D (26.5%).

Table -1.2: Distribution of respondents on the basis of their knowledge level on calcium and vitamin D  
N=600

Knowledge Level (0-9)	Distribution of respondents on the basis of their knowledge level	
	f	%
Low (0-2)	261	43.50
Moderate (3-6)	309	51.50
High (7-9)	30	5.00

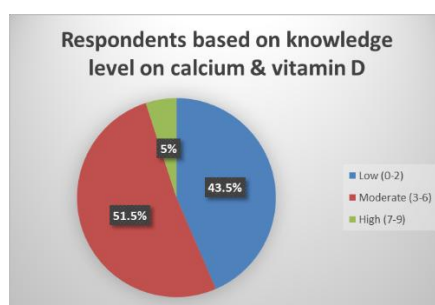


Fig.2

Table -2 exhibits that 51.50 % respondents have moderate level knowledge followed by 43.50 % having low level knowledge .Only 5.00% respondents possess high level of knowledge on calcium and vitamin D with special context to bone health of adult women.

Thus majority of respondents possess low to moderate level knowledge on calcium and vitamin D while respondents possessing high knowledge level constitute less percentage.

Results of the above table is similar to the findings of Folasire et.al.(2017) whose study Calcium Knowledge and Consumption Pattern of Calcium-rich Foods among Female University Students in South-west Nigeria reveals that there was a low level of knowledge about calcium among the respondents .

**Table -2.1: Association between knowledge level and selected socio-demographic variables**

N = 600

Variables	Category	High	Moderate	Low	p-value
Age Group	19-20	10 (1.7%)	132 (22%)	131 (21.8%)	.001
	21-22	3 (0.5%)	102 (17%)	77 (12.8%)	
	≥23	17 (2.8%)	75 (12.5%)	53 (8.8%)	
Caste	General	17 (2.8%)	164 (27.3%)	107 (17.8%)	.058
	Backward Caste	12 (2%)	100 (16.7%)	104 (17.3%)	
	Scheduled Caste	1 (0.2%)	44 (7.3%)	49 (8.2%)	
	Scheduled Tribe	0 (0%)	1 (0.2%)	1 (0.2%)	
Educational Level of the Respondents	Graduation	13 (2.2%)	223 (37.2%)	210 (35%)	.001
	Post graduation	17 (2.8%)	86 (14.3%)	51 (8.5%)	
Respondent's mother educational Level	Graduation or higher	14 (2.3%)	16 (2.7%)	16 (2.7%)	.001
	Intermediate	4 (0.7%)	66 (11%)	34 (5.7%)	
	Matric	9 (1.5%)	126 (21%)	97 (16.2%)	
	No formal education	3 (0.5%)	101 (16.8%)	114 (19%)	
Occupation of respondent's mother	House wife	19 (3.2%)	245 (40.8%)	202 (33.7%)	.001
	Farming & Allied activities	0 (0%)	16 (2.7%)	29 (4.8%)	
	Service	8 (1.3%)	32 (5.3%)	25 (4.2%)	
	Business	3 (0.5%)	16 (2.7%)	5 (0.8%)	
Monthly Income of the Family	Up to 30000	9 (1.5%)	165 (27.5%)	174 (29%)	.001
	30000-50000	10 (1.7%)	85 (14.2%)	61 (10.2%)	
	50000-100000	6 (1%)	47 (7.8%)	22 (3.7%)	
	>100000	5 (0.8%)	12 (2%)	4 (0.7%)	
Locality of the College	Rural	3 (0.5%)	149 (24.8%)	148 (24.7%)	.001
	Urban	27 (4.5%)	160 (26.7%)	113 (18.8%)	

Perusal of above table shows that knowledge level of the respondents is significantly associated with age ,education level of the respondents ,education level of respondent's mother, occupation of mothers ,monthly income of the family and locality of the college ( p-value .001) .However insignificant association is found between knowledge level of the respondents and their caste (p-value .058).

Kambal et al.(2023) studied vitamin D knowledge, awareness and practices of female students in the Southwest of Saudi Arabia and univariate and multivariate logistic regression models demonstrated a significant association between knowledge, and residence and source of information (odds ratios = 3.48 and 2.79, respectively,  $P < .05$ ).

## V. Summary And Conclusion

It may be concluded from the study that slightly more than half of the study sample have moderate knowledge level followed by 43.50 % with low knowledge level and very less proportion of sample (5.00%) have high knowledge level on calcium and vitamin D. Regarding sources of calcium and vitamin D majority of the sample know only one source while very less proportion of respondents have knowledge regarding daily requirement of vitamin D and calcium . Furthermore nearly one third respondents know correct duration of sun exposure to meet the requirement of vitamin D and one fourth respondents know that use of sun screen reduces absorption of vitamin D.

Again from the results it may be concluded that respondent's knowledge level is significantly associated with age, education of respondents ,education level of mothers ,mother's occupation and monthly family income of the family(.001). However knowledge level is not significantly associated with caste(p=.058).

### Implications Of The Study

Review of previous studies show that most of the studies have been carried out on osteoporosis and its management but limited works were conducted on awareness and knowledge of calcium and vitamin D specially among college girls. Further more researches are needed to be done at regional level. Furthermore conducting researches at school and college level will generate awareness and enhance knowledge level of the female population in early stage which will impact the bone health in long run. Knowing existing awareness and knowledge of college girls toward calcium and vitamin D will also help in preparing appropriate strategies to curb the situation related to women bone health.

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