



E-ISSN: 2664-2301  
P-ISSN: 2664-2298  
IJOGN 2022; 4(2): 01-04  
Received: 03-04-2022  
Accepted: 04-05-2022

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## Assess the effectiveness of structured teaching program on knowledge regarding vitamin D deficiency related to pre term birth among 1<sup>st</sup> year B.B.Sc. Nursing students in selected college of the city

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### Abstract

**Background:** Vitamin D deficiency or insufficiency is common in pregnancy. Globally, it is the leading cause of prenatal and neonatal mortality and morbidity. Preterm infants are particularly vulnerable to complications due to impaired respiration, difficulty in feeding, poor body temperature regulation and high risk of infection.

**Aims:** To assess the effectiveness of structured teaching program on knowledge regarding vitamin D deficiency related to pre term birth

**Objectives:** To assess the pretest knowledge regarding vitamin-D deficiency related to preterm birth, To assess the effectiveness of structure teaching program and to find out the association between knowledge score with their demographic variables

**Methodology:** 30 samples of 1<sup>st</sup> year B.B.Sc. nursing students. Quantitative approach with experimental design by using non probability convenient sampling.

**Results:** 10% of students had good level, 46.67% had very good level and 43.33% students had excellent level of knowledge score and associated with age of sample and parents education.

**Keywords:** assess, effectiveness, Vit D deficiency, pre term birth, nursing students

### Introduction

Vitamin D deficiency means that you are not getting enough vitamin D to stay healthy. Vitamin D is unique because your skin actually produces it by using sunlight. Fair-skinned individuals and those who are younger convert sunlight into vitamin D better than those who are darker-skinned and over age 50<sup>[1]</sup>.

Preterm birth is defined as babies born alive before 37 weeks of pregnancy are completed. There are sub-categories of preterm birth based on gestational age: extremely preterm [less than 28 weeks], Very preterm (28 to 32 weeks) and Moderate to late preterm (32 to 37 weeks). Preterm birth is also known as pre-mature birth. The symptoms of preterm labor include uterine contractions which occur more often than every 10 minutes and for the leaking of fluid from the vagina before 37 weeks. Pre-mature infants are at greater risk for cerebral palsy, delays in development<sup>[2]</sup>.

In 2021 research study aimed to assess the severity of respiratory distress syndrome in preterm infants who are  $\leq 34$  weeks GA, with a birth weight of  $\leq 2$  kg, and its relation to their serum blood level of vitamin D. **Materials and methods:** This is a multicenter study conducted at Neonatal Intensive Care Unit (NICU) and the result was Vitamin D deficiency was widely prevalent among preterm neonates. Pneumothorax, surfactant doses, oxygen, and mechanical ventilation requirements were statistically significant at vitamin D deficiency<sup>[3]</sup>.

### Need of the study

There are disagreements among researchers about the association between vitamin D deficiency during pregnancy and preterm birth (PTB). The meta-analysis of 10 studies included 10,098 participants and found that pregnant women with vitamin D deficiency (maternal serum 25 (OH) D levels  $< 20$  mg/mL) experienced a significantly increased risk of PTB (odds ratio (OR) = 1.29, 95% confidence intervals (CI): 1.16, 1.45) with low heterogeneity ( $I^2 = 25\%$ ,  $p = 0.21$ ). Sensitivity analysis showed that exclusion of any single study did not materially alter the overall combined effect.

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In the subgroup analyses, we found that heterogeneity was obvious in prospective cohort studies ( $I^2 = 60\%$ ,  $p = 0.06$ ). In conclusion, pregnant women with vitamin D deficiency during pregnancy have an increasing risk of PTB [4].

A prospective cohort study comprising 289 pregnant women in a hospital and Participants were followed-up from weeks 10-12 of gestation to postpartum. Serum 25-hydroxyvitamin D, parathyroid hormone, calcium, and phosphorus were measured within the first week after recruitment. Pearson's  $\chi^2$  test, Mann-Whitney U test, binary and multivariable logistic regression models were used to explore associations between variables and outcomes. 36.3% of the participants were vitamin D deficient ( $<20$  ng/mL). 25-hydroxyvitamin D concent

3ration was inversely correlated with parathyroid hormone ( $\rho = -0.146$ ,  $p = 0.013$ ). Preterm birth was associated with vitamin D deficiency in the multivariable model, being this association stronger amongst women with parathyroid hormone serum levels above the 80th percentile (adjusted odds ratio (aOR) = 6.587, 95% CI (2.049, 21.176),  $p = 0.002$ ). Calcium and phosphorus were not associated with any studied outcome. Combined measurement of 25-hydroxyvitamin D and parathyroid hormone could be a better estimator of preterm birth than vitamin D in isolation<sup>5</sup> A randomized double-blind clinical pilot trial, including preterm infants born at 32 + 6 to 36 + 6 weeks of gestation. The control group received 400 international units (IU) of cholecalciferol daily compared to 800 IU daily in the intervention group. Levels of 25(OH) vitamin D were measured at birth and 6 and 12 months of age. Respiratory morbidity was followed until 1 year of age. Results were 50 subjects were recruited during the study period; the median measured 25(OH) vitamin D levels in the control vs intervention groups were: 26.5 vs 34 nmol/L ( $P = .271$ ) at birth, 99 vs 75.5 nmol/L ( $P = .008$ ) at 6 months and 72.5 vs 75 nmol/L ( $P = .95$ ) at 12 months of age. Infants with insufficient vitamin D ( $<75$  nmol/L) levels had higher respiratory morbidity. Serum vitamin 25(OH) D is a fair predictor for respiratory symptoms (area under the curve [AUC], 0.697; 95% confidence interval [CI], 0.509-0.885;  $P = .047$ ) and for recorded acute respiratory illnesses (AUC, 0.745; 95% CI, 0.569-0.922;  $P = .012$ ).

Conclusion: Doubling the daily intake of vitamin D in premature infants did not increase serum 25(OH) vitamin D level, due to poor compliance in the intervention group. We found an inverse association between serum 25(OH) vitamin D and respiratory symptoms, indicating vitamin D deficiency is a fair predictor for respiratory morbidity [6].

### Problem statement

A study to assess the effectiveness of structured teaching program on knowledge regarding vitamin D deficiency related to pre term birth among 1<sup>st</sup> year B.B.Sc. Nursing students in selected college of the city.

### Objectives:

- To assess the pretest knowledge regarding vitamin-D deficiency related to preterm birth among 1<sup>st</sup> year B.B.Sc. Nursing in selected college of the city
- To assess the effectiveness of structure teaching program on knowledge regarding vitamin-D deficiency related to preterm birth among 1<sup>st</sup> year B.B.Sc. Nursing student in selected college of the city
- To find out the association between knowledge score with their demographic variables.

### Hypothesis

- **H0:** There will be no significant difference in the knowledge score regarding Vitamin D deficiency related to preterm birth among 1<sup>st</sup> year B.B.Sc. nursing students, in selected college of the city.
- **H1:** There will be significant difference in the knowledge score regarding Vitamin D deficiency related to preterm birth among 1<sup>st</sup> year B.B.Sc. nursing students in selected college of the city
- **H2 :** There will be significant association between pre-test knowledge score regarding Vitamin D deficiency related to preterm birth among 1<sup>st</sup> year B.B.Sc. nursing students, in selected college of the city with their selected demographical variable and background variable.

### Delimitation

- Study is delimited to first year B.B.Sc nursing population, no other year / faculty population is involved
- This study is delimited to the student of age 21-26 only studying college of city.

### Research Approach

In this study, quantitative approach was used.

### Research Design

In this study pre experimental research design was used to identify, describe and explore the existing phenomenon and its related factor.

### Research Setting

B.B.Sc. nursing college was the research setting for the study.

### Target Population

In this study the target population selected for the study consist of 1<sup>st</sup> year Basic B.Sc. Nursing (Age:- 21 to 26)

### Accessible Population

The assessable population selected for the study comprises of who were available at the time of data collection and who were fulfilling the inclusion criteria.

### Sample

In this study, the sample consist of 30 (1<sup>st</sup> year Basic B.Sc. nursing student) who were available during the period of data collection.

### Sampling Technique

In this study non-probability convenient sampling technique is used.

### Sample Size

Sample size consist of 30 samples of 1<sup>st</sup> B.B.Sc. Nursing students of selected college of the city who were available during the period of data collection were the sample for this study as mentioned in inclusion criteria.

### Inclusion Criteria

In this study, inclusion criteria were adolescent girls who were-

- 1<sup>st</sup> year B.B.Sc. Nursing student between the age 19-23
- 1<sup>st</sup> year B.B.Sc. Nursing student who are willing to

participate.

- 1<sup>st</sup> year B.B.Sc. Nursing student who are available during the data collection.
- 1<sup>st</sup> year B.B.Sc. Nursing student who are able to read, write and speak English.

#### Exclusion Criteria:

- 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> B.B.Sc. nursing student
- Student who are not willing to participate

#### Variables of the Study

In experimental research studies variables are observed under natural setting as they exist, without manipulating or imposing the effect of intervention or treatment. Two types of variables are identified in the study they are demographic variables and research variables.

#### Research variable

The research variable in this study is knowledge regarding

Vitamin D deficiency related to preterm birth

#### Demographic variable

The demographic variables in this study were age, gender, religion, education parents.

#### Description of Tool

##### Section A- Demographic data

It includes the variables like age, gender, religion, Education of parents.

##### Section B- Structured knowledge questionnaire

The questionnaire consist of 30 questions which were subdivided into knowledge about Introduction and definition, etiology, risk factor, causes, complications treatment nutrition and diet. Total score was 30. Each question carries 1 mark and 0 for the wrong answer.

**Table 1:** Percentage wise distribution of 1<sup>st</sup> year B.B.Sc. Nursing students according to their demographic characteristics. n=30

Demographic Variables	No. of 1 <sup>st</sup> year B.B.Sc. Nursing students	Percentage (%)
<b>Age(years)</b>		
19-20 years	22	73.3
20-22 years	8	26.7
22-23 years	0	0
>23 years	0	0
<b>Gender</b>		
Male	10	33.3
Female	20	66.7
Others	0	0
<b>Religion</b>		
Hindu	20	66.7
Muslim	0	0
Buddhist	10	33.3
Christian	0	0
Others	0	0
<b>Education of parent</b>		
Medical	3	10.0
Non-Medical	27	90.0

**Table 2:** Significance of difference between knowledge score in pre and posttest of 1<sup>st</sup> year B.B.Sc. Nursing (n=30)

Overall	Mean	SD	Mean Difference	t-value	p-value
Pre Test	14.53	3.96	8.80±3.08	15.60	0.0001
Post Test	23.33	3			S,p<0.05

**Table 3:** Association of posttest knowledge score was with the age of sample

Age (years)	No. of nursing students	Mean posttest knowledge score	t-value	p-value
19-20 years	22	22.40±3.01	3.20	0.003 S,p<0.05
20-22 years	8	25.87±0.35		
22-23 years	0	0±0		
>23 years	0	0±0		

**Table 4:** Association of post test knowledge score was with education of parents

Parent's Education	No. of nursing students	Mean posttest knowledge score	t-value	p-value
Medical	3	26±0	5.07	0.0001
Non-Medical	27	23.03±3.03		S,p<0.05

#### Major findings

- Pretest findings were 30% of 1<sup>st</sup> year B.B.Sc. Nursing students had average level of knowledge score, 53.33% of them had good and 16.67% of 1<sup>st</sup> year B.B.Sc. Nursing students had excellent level of knowledge score.
- Posttest findings were 10% of 1<sup>st</sup> year B.B.Sc. Nursing students had good level of knowledge score, 46.67% had very good and 43.33% of 1<sup>st</sup> year B.B.Sc. Nursing students had excellent level of knowledge score
- Association of posttest knowledge score was with age of sample and education of parents

**Conclusion**

This study concluded that 30% of 1<sup>st</sup> year Basic B.Sc. Nursing students had average level of knowledge score, 53.33% of them had good and 16.67% of 1<sup>st</sup> year B.B.Sc. Nursing students had excellent level of knowledge score.

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