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A STUDY TO ASSESS THE EFFECTIVENESS OF STRUCTURED TEACHING PROGRAMME ON PREVENTION AND MANAGEMENT OF VITAMIN D DEFICIENCY AMONG MOTHERS OF UNDER FIVE CHILDREN IN SELECTED AREA, DELHI

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ABSTRACT

A Study was conducted to assess the effectiveness of Structured Teaching Programme in terms of Knowledge on prevention and management of Vitamin D deficiency among mothers of under-five children in selected area Delhi. The study aims to assess the pretest and post-test/ knowledge regarding the importance of Vitamin D among Mothers of Under Five Children after administer STP, Evaluate the effectiveness of STP and find out the association with selected demographic variables. A pre-experimental one group Pre-test Post test only research design was used to accomplish the stated objectives in the study. A total of 100 Mothers were selected for the study using non- probability total enumerative sampling technique. The data analysis was done using Descriptive and inferential statistics. The pre-test study results showed that only 7% of mothers had good knowledge, 58% of mother's workers had average knowledge and 35% of mothers had below average knowledge regarding prevention and management of Vitamin D deficiency. However, after the administration of the STP the post-test knowledge scores presented that 55% mothers had good knowledge, 45% had average knowledge whereas none of the mothers had below average knowledge score regarding prevention and management of Vitamin D deficiency. There is significant association found by calculated Chi- square Value at 0.05 level of significance. Pre-test mean ± SD was 12.68+ 4.333 and Post-test mean ± SD was 20.14+ 3.090. Mean pretest knowledge score of the sample was lower than the mean post-test knowledge score with a mean difference of 7.42. The calculated 'Z' value (13.94) was more than the table value (2.00) at $p < 0.05$ level of significance. Hence, the study results concluded that the structured teaching programme was effective in increasing the knowledge of the mothers of under five children regarding prevention and management of vitamin D deficiency.

KEYWORDS

Vitamin D, Ultraviolet B, International Unit, Structured Teaching Programme, Under Five Children, Rickets

INTRODUCTION

Adequate nutrition in the first years of a child's is very important and it provides the essential building blocks for brain development, healthy growth, and a strong immune system, improves bone strength and it helps prevent future non-communicable diseases associated with overweight Vitamin D plays an important role in body's immunological functions, nutritional status, physical and cognitive growth of children.[1]Vitamin D deficiency and VD insufficiency has been found in all age groups including children and pregnant mothers belonging to different socioeconomic strata from all over the World.[2]

Vitamin D plays a crucial role in calcium and phosphate absorption, bone growth, mineralization, and remodeling, thereby preventing rickets in children, osteomalacia in adults, and osteoporosis in older age; it also influences immune function, inflammation, glucose metabolism, and cell growth. Despite its importance, vitamin D deficiency is a global public health problem, highly prevalent across all age groups, particularly in children, pregnant women, older adults, and populations in regions such as India, the Middle East, and parts of Asia, largely due to limited dietary sources and inadequate sunlight exposure.[3] Deficiency during childhood impairs skeletal development, leading to rickets, while lifelong deficiency increases fracture risk and is associated with several chronic diseases. Vitamin D exists mainly as D2 and D3, with D3 synthesized in the skin through UVB exposure and both forms being well absorbed from diet and supplements. Prevention and management rely on sensible sun exposure, consumption of vitamin D–rich or fortified foods (such as fatty fish, fortified milk and cereals), and supplementation, with current recommendations advising at least 400 IU/day for infants and children and higher doses for adults, while therapeutic regimens often Favor cholecalciferol for correcting deficiency.[4]

As Rickets in infants attributable to inadequate vitamin D intake and decreased exposure to sunlight continues to be reported. It is now recommended that all infants and children, including adolescents, have a minimum daily intake of 400 IU of vitamin D beginning soon after birth. The current recommendation replaces the previous recommendation of a minimum daily intake of 200 IU/day of vitamin D supplementation beginning in the first 2 months after birth and continuing through adolescence.[5]

Vitamin D is essential for strong bones as it helps to absorb calcium from diet. Vitamin D deficiency mainly occurs if strict vegetarian diet is followed as mostly the source of vitamin D is animal based. Low vitamin D levels result in increased possibility of gestational diabetes among pregnant women, low birth weight and pre-eclampsia in infants, and mothers may suffer bone impairment, osteoporosis, hypocalcaemia, and hypertension. Vitamin D deficiency is directly linked with severe complication in mothers and neonates, causing rickets, poor fetal growth and infantile eczema in neonates. Higher prevalence rate of vitamin D deficiency has led professionals to emphasize on development of relevant precautionary measures[6]

METHODOLOGY

This chapter describes the methodology adopted to assess the effectiveness of a Structured Teaching Programme (STP) on prevention and management of Vitamin D deficiency among mothers of under-five children in a selected area of Delhi.

Research Approach A quantitative research approach was adopted to objectively assess the effectiveness of the structured teaching programme. A pre-experimental one-group pre-test–post-test design was used. Knowledge was assessed before (O_1) and after (O_2) administration of the structured teaching programme (X). No control group was included.

Variables

- **Independent Variable:** Structured Teaching Programme on Vitamin D deficiency
- **Dependent Variable:** Knowledge of mothers of under-five children
- **Demographic Variables:** Age, education, religion, marital status, number of under-five children, occupation, income, type of family, previous knowledge, and source of information

The study was conducted in a selected area of Sunder Nagri, Delhi, chosen for accessibility, availability of subjects, and feasibility. The population consisted of mothers of under-five children residing in the selected area of Delhi. A sample of 100 mothers of under-five children was selected using non-probability purposive sampling.

Criteria for Sample Selection: Inclusion Criteria Mothers of under-five children available during data collection, Willing to participate, Able to read and understand Hindi and for the **Exclusion Criteria** Mothers not available during data collection, Mothers without under-five children, Unwilling participants

A structured knowledge questionnaire was developed based on literature review, expert opinion, and guidance from the research supervisor. The tool consisted of Demographic data and 30 multiple-choice questions on prevention and management of Vitamin D deficiency Each correct answer scored one mark total score ranged from 0–30. Knowledge Level Interpretation: (0–10) Below average, (11–20) Average, (21–30) Good. The Content validity was established by nine experts from relevant medical and nursing specialties. Reliability was assessed using KR-20, yielding a reliability coefficient of 0.79, indicating good reliability. Ethical clearance was obtained from the Ethical Committee of St. Stephen's Hospital. Written

permission, informed consent, confidentiality, and anonymity were ensured throughout the study.

Pilot Study
A pilot study was conducted on 10 mothers in AB Block, Sunder Nagri, from 02/05/2022 to 07/05/2022. The tool was found feasible, clear, and understandable.

Data Collection Procedure
Final data collection was carried out from 13/06/2022 to 02/07/2022. A pre-test was administered on day one, followed by the structured teaching programme. A post-test was conducted on the fifth day using the same questionnaire.

Plan for Data Analysis
- Descriptive statistics: Frequency, percentage, mean, median, and standard deviation
- Inferential statistics: Z-test to assess effectiveness and Chi-square test to determine association between knowledge scores and demographic variables

RESULT
The collected data were organized and presented under the following sections:
The data were analyzed based on the objectives and hypotheses of the study using descriptive and inferential statistics. Data were tabulated using Microsoft Excel. Descriptive statistics included frequency, percentage, mean, median, and standard deviation, while inferential statistics included Z-test and Chi-square test.

The findings were organized into four sections: Section I: Demographic characteristics Section II: Pre-test and post-test knowledge levels Section III: Effectiveness of the structured teaching programme Section IV: Association between knowledge scores and demographic variables

Most mothers were aged 23–32 years, had primary or high school education, belonged to the Muslim or Hindu religion, and were married (100%). The majority had one under-five child (75%), were housewives (82%), belonged to nuclear families (52%), and had a monthly income of ₹5001–₹10,000 (45%). About 77% had previous knowledge of Vitamin D deficiency, with mass media (37%) and Anganwadi/ANM (26%) being the main sources of information.

Knowledge on Prevention and Management of Vitamin D Deficiency Pre-test findings: Average knowledge: 58%, Below average knowledge: 35%, Good knowledge: 7% Post-test findings: Good knowledge: 55%, Average knowledge: 45%, Below average knowledge: 0% These findings indicate a marked improvement in knowledge after the intervention.

Effectiveness of Structured Teaching Programme: Pre-test mean score: 12.68 ± 4.33, Post-test mean score: 20.10 ± 3.09, Mean difference: 7.42, Calculated Z value: 13.94, Table value at $p < 0.05$: 2.00. Since the calculated Z value exceeded the table value, research hypothesis H_1 was accepted and null hypothesis H_{01} was rejected, confirming the effectiveness of the structured teaching programme.

Association Between Knowledge and Demographic Variables: No significant association was found between knowledge scores and age, religion, marital status, number of children, and type of family and Significant association was observed with level of education, occupation, monthly family income, previous knowledge of Vitamin D deficiency, and source of information. Thus, research hypothesis H_2 was partially accepted and null hypothesis H_{02} was partially rejected.

DISCUSSION
The study revealed that mothers initially had average to below-average knowledge regarding vitamin D deficiency. After the structured teaching programme, there was a significant improvement in knowledge levels.

These findings are consistent with studies by Prithi Taranga et al. (2019) and Al-Mutairi et al. (2018), which demonstrated significant improvement in knowledge following educational interventions. However, the findings differ from epidemiological studies such as Basu et al. (2015), which focused on prevalence rather than educational outcomes. Overall, the study supports the effectiveness of structured educational interventions in improving maternal knowledge.

CONCLUSION
The study concluded that: the Structured teaching programmes significantly improve mothers' knowledge regarding vitamin D deficiency. Post-test knowledge scores were significantly higher than pre-test scores. Knowledge improvement was influenced by education, income, occupation, previous knowledge, and source of information.

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