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"A Study To Assess The Effectiveness Of A Structured Teaching Programme On Knowledge Regarding Selected Essential Vitamins And Their Health Outcomes Among Postnatal Mothers In A Rural Area Of Mehsana, Gujarat."

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Abstract: A community-based cross-sectional study was conducted in a rural area of Ethiopia to assess the level of nutrition knowledge among mothers and to identify factors associated with adequate knowledge. Data were collected using a structured interviewer-administered questionnaire covering socio-demographic variables, nutrition knowledge, and access to health information. The findings revealed that a considerable proportion of mothers had inadequate nutrition knowledge. Higher educational status, better socioeconomic conditions, exposure to nutrition-related health information, and utilization of antenatal and postnatal care services were significantly associated with improved knowledge levels. Mothers who received nutrition counselling from healthcare providers demonstrated better understanding of nutritional requirements compared to those who did not. The study concluded that maternal nutrition knowledge in rural communities remains suboptimal and emphasized the need for structured nutrition education and counselling integrated into maternal and child health services to enhance maternal and child health outcomes.

Index Terms – Essential Vitamins, Postnatal Mothers

I. INTRODUCTION

Vitamins are organic compounds that are **essential in small amounts for normal growth, metabolism, and overall health,** but cannot be synthesized in adequate quantities by the human body. They play critical roles in processes such as immune function, energy metabolism, and tissue repair.[1]

Vitamins are classified into two main types based on their solubility: **fat-soluble vitamins** (A, D, E, and K) and **water-soluble vitamins** (C and the B-complex group, including B1, B2, B3, B6, B12, folic acid, and biotin) Fat-soluble vitamins are stored in the liver and fatty tissues and are essential for vision, bone health, antioxidant functions, and blood clotting, while water-soluble vitamins are not stored extensively and must be consumed regularly to support energy metabolism, immune function, nerve health, and tissue repair. For postnatal mothers, certain vitamins are particularly important to promote maternal recovery, enhance lactation, and support infant development. These include **vitamin A** (for vision and immunity), **vitamin D** (for bone and calcium metabolism), **vitamin B12 and folic acid** (for blood formation and neurological health), and **vitamin C** (for wound healing and immune support). Ensuring adequate intake of these vitamins helps prevent deficiencies, supports physical recovery after childbirth, and promotes the overall well-being of both mother and infant.[2]

A postnatal mother is a woman who has recently given birth and is undergoing a period of physiological, psychological, and social adjustments following childbirth. This period, also known as the puerperium, typically lasts for six weeks, during which the body undergoes recovery from pregnancy and delivery. Postnatal mothers experience changes in hormone levels, uterine involution, and lactation, which require increased nutritional support to promote healing, replenish nutrient stores, and maintain overall health. Adequate care during this period is essential not only for maternal recovery but also for successful breastfeeding, prevention of postpartum complications, and ensuring the health and development of the newborn. Emotional support, proper nutrition, rest, and regular monitoring of physical and mental well-being are key aspects of postnatal care, which collectively contribute to the mother's physical and psychological adjustment during this critical phase.[3]

Low intake or deficiency of essential vitamins in postnatal women can lead to a variety of adverse health outcomes, affecting both maternal recovery and infant well-being. Deficiency of vitamin A may impair immune function, increase susceptibility to infections, and delay tissue repair, while insufficient vitamin D can result in bone demineralization, muscle weakness, and an increased risk of postpartum depression. Lack of vitamin B12 and folic acid may cause anaemia, fatigue, neurological disturbances, and impaired cognitive function. Vitamin C deficiency can slow wound healing, reduce antioxidant protection, and increase vulnerability to infections. Collectively, inadequate vitamin intake during the postnatal period may compromise energy levels, physical recovery, lactation quality, and the overall health of both mother and infant, highlighting the critical importance of maintaining adequate vitamin nutrition during this phase.[4]

Nutrition during the postnatal period plays a critical role in supporting the mother's physical recovery, replenishing nutrient stores depleted during pregnancy and childbirth, and enhancing overall health and well-being. A balanced postnatal diet helps rebuild tissues, supports wound healing, and restores energy levels, which are essential for coping with the increased metabolic demands of caring for a newborn. Adequate intake of macro- and micronutrients, including vitamins, minerals, proteins, and healthy fats, is also important for maintaining maternal immunity and preventing postpartum complications such as anemia, fatigue, and infections. Furthermore, proper nutrition supports successful lactation by ensuring the quality and quantity of breast milk, which directly affects infant growth and development. Studies show that dietary practices during the postnatal period significantly influence long-term health outcomes for both the mother and the infant, and that nutritional support and counseling can improve healthy eating behaviors and dietary adequacy in this critical phase. [5]

Deficiency of essential vitamins in postnatal mothers can lead to a range of adverse health outcomes that affect both maternal recovery and infant care. Inadequate vitamin A may impair immune function, increase susceptibility to infections, and delay tissue repair. Vitamin D deficiency can result in poor calcium absorption, leading to weakened bones, muscle weakness, and an increased risk of postpartum depression. Insufficient vitamin B12 and folic acid may cause anemia, fatigue, neurological disturbances, and cognitive difficulties, while a lack of vitamin C can slow wound healing, reduce antioxidant protection, and increase vulnerability to infections. Overall, vitamin deficiencies during the postnatal period can compromise energy levels, delay physical recovery, reduce lactation quality, and negatively affect the health and development of the newborn. Early identification and supplementation of deficient vitamins are crucial to support maternal well-being and optimal infant growth.[6]

Knowledge regarding vitamins among postnatal mothers is crucial because adequate vitamin intake during the postnatal period supports maternal recovery, enhances immune function, and ensures optimal growth and development of the infant. In rural areas, postnatal women are more vulnerable to nutritional deficiencies due to limited health education, socioeconomic constraints, and inadequate access to maternal nutrition services. Poor awareness about essential vitamins and their dietary sources may result in inappropriate feeding practices and delayed recovery after childbirth. Therefore, assessing the level of knowledge related to vitamins among postnatal mothers is essential to identify educational needs and to design effective interventions aimed at improving maternal and neonatal health outcomes.[7]

Although several studies have emphasized the importance of maternal nutrition during pregnancy and the postnatal period, limited research has specifically focused on the knowledge of postnatal mothers regarding essential vitamins and their health benefits. Existing literature predominantly addresses supplementation programs or general dietary practices, with comparatively fewer studies assessing awareness, understanding, and educational needs related to vitamins among postnatal women, particularly in rural settings. Furthermore, evidence on the effectiveness of structured teaching programmes aimed at improving vitamin-related knowledge among postnatal mothers remains insufficient. This lack of focused educational and interventional studies highlights a significant gap in the literature and underscores the need for the present study.[8]

Educational interventions play a vital role in improving maternal knowledge and promoting healthy nutritional practices during the postnatal period. A structured teaching programme provides a systematic and organized approach to delivering accurate information regarding essential vitamins, their sources, and health benefits, thereby addressing existing knowledge gaps among postnatal mothers. Such programmes are particularly effective in rural settings, where access to consistent health education may be limited. Evidence suggests that structured, need-based educational interventions can significantly enhance maternal understanding, influence positive dietary behaviors, and contribute to improved maternal and infant health outcomes. Therefore, implementing a structured teaching programme is an appropriate and effective strategy to improve vitamin-related knowledge among postnatal mothers.[9]

III. RESEARCH METHODOLOGY

A quantitative approach with a quasi-experimental one-group pre-test and post-test design was adopted to assess the effectiveness of a structured teaching programme on knowledge regarding selected essential vitamins among postnatal mothers in a selected rural area of Mehsana district, Gujarat. A total of **100** postnatal mothers were selected using a non-probability purposive sampling technique based on predefined inclusion and exclusion criteria. Data were collected using a structured questionnaire consisting of demographic variables and multiple-choice questions assessing knowledge related to selected essential vitamins (vitamin A, vitamin D, vitamin B12, folic acid, and vitamin C), their sources, functions, and health benefits. Following the pre-test, a structured teaching programme was administered using lecture-cum-discussion and visual aids. A post-test was conducted seven days after the intervention using the same questionnaire to evaluate knowledge improvement. Content validity of the tool was established by experts, and reliability was ensured using the split-half method. Ethical approval was obtained, informed consent was secured from participants, and data were analyzed using descriptive and inferential statistics, including paired t-test and chi-square test.

IV. RESULTS AND DISCUSSION

Objective 1: To assess the level of knowledge regarding selected essential vitamins among postnatal mothers

Table 4.1: Distribution of Postnatal Mothers According to Knowledge Level (n = 100)

Knowledge Level	Pre-test (n)	Post-test (n)
Poor	48	6
Average	38	24
Good	14	70

Table 1 shows that in the pre-test, the majority of postnatal mothers (48%) had poor knowledge regarding selected essential vitamins, while only 14% had good knowledge. After the structured teaching programme, a substantial improvement was observed, with 70% of mothers attaining good knowledge and only 6% remaining in the poor knowledge category. This indicates a marked improvement in knowledge levels following the intervention.

Objective 2: To evaluate the effectiveness of the structured teaching programme

Table 4.2: Comparison of Mean and Standard Deviation of Knowledge Scores (n = 100)

Test	Mean	Standard Deviation
Pre-test	12.4	3.1
Post-test	22.8	2.4

Table 2 reveals a significant increase in the mean knowledge score from 12.4 ± 3.1 in the pre-test to 22.8 ± 2.4 in the post-test, indicating that the structured teaching programme was effective in improving knowledge regarding selected essential vitamins among postnatal mothers.

Objective 3: To determine the statistical significance of the difference between pre-test and post-test knowledge scores

Table 4.3: Paired *t*-Test Showing Effectiveness of Structured Teaching Programme (n = 100)

Comparison	Mean Difference	*t* value	*p* value	Significance
Pre-test vs Post-test	10.4	18.62	<0.001	Highly Significant

Table 3 indicates that the calculated t value (18.62) is statistically significant at $p < 0.001$, demonstrating a highly significant difference between pre-test and post-test knowledge scores. This confirms the effectiveness of the structured teaching programme in improving vitamin-related knowledge among postnatal mothers.

Objective 4: To find the association between pre-test knowledge scores and selected demographic variables

Table 4.4: Association Between Pre-test Knowledge Scores and Selected Demographic Variables (Chi-square Test) (n = 100)

Demographic Variable	Chi-square value (χ^2)	df	p value	Significance
Age	2.18	2	0.336	Not Significant
Education	9.84	2	0.007	Significant
Occupation	6.27	2	0.043	Significant
Type of Family	1.96	1	0.162	Not Significant
Parity	4.89	2	0.087	Not Significant
Source of Health Information	8.11	2	0.017	Significant

Table 4 depicts the association between pre-test knowledge scores and selected demographic variables of postnatal mothers. A statistically significant association was observed between pre-test knowledge scores and educational status ($\chi^2 = 9.84$, $p = 0.007$), occupation ($\chi^2 = 6.27$, $p = 0.043$), and source of health information ($\chi^2 = 8.11$, $p = 0.017$), indicating that these factors significantly influenced baseline knowledge regarding essential vitamins. However, no statistically significant association was found between pre-test knowledge scores and age, type of family, or parity, suggesting that these variables did not have a significant impact on baseline knowledge levels among postnatal mothers.

Objective 5: To assess the perceived improvement in health outcomes among postnatal mothers following the structured teaching programme

Table 5.1: Distribution of Postnatal Mothers According to Selected Health Outcomes (n = 100)

Health Outcome	Pre-test (n, %)	Post-test (n, %)	Mean ± SD (Pre)	Mean ± SD (Post)	t value	p value	Significance
Wound Healing	40 (40%)	70 (70%)	2.3 ± 0.8	3.8 ± 0.6	15.2	<0.001	Highly Significant
Energy Levels	35 (35%)	75 (75%)	2.5 ± 0.9	4.0 ± 0.5	16.8	<0.001	Highly Significant
Lactation Quality	30 (30%)	68 (68%)	2.2 ± 0.7	3.9 ± 0.6	14.7	<0.001	Highly Significant
Infection Susceptibility	25 (25%)	65 (65%)	2.0 ± 0.8	3.7 ± 0.5	15.0	<0.001	Highly Significant

Table 5.1 demonstrates that following the structured teaching programme on selected essential vitamins, postnatal mothers reported significant improvements in key health outcomes. The proportion of mothers experiencing satisfactory wound healing increased from 40% in the pre-test to 70% in the post-test, indicating enhanced tissue repair likely due to adequate intake of vitamins A and C. Similarly, energy levels improved markedly, with 75% of mothers reporting increased vitality post-intervention compared to 35% at baseline, reflecting overall improvement in nutritional status. Lactation quality also showed notable enhancement, rising from 30% to 68%, suggesting that improved knowledge and dietary intake of vitamins such as B12, folic acid, and A contributed to better milk production and quality. Additionally, infection susceptibility decreased, with more mothers reporting fewer infections after the programme, highlighting the role of vitamins A and C in supporting immune function. Paired t-test analysis confirmed that all observed improvements were highly significant ($p < 0.001$), demonstrating that the structured teaching programme was effective not only in increasing knowledge but also in supporting positive health outcomes among postnatal mothers.

DISCUSSION

The present study aimed to assess the effectiveness of a structured teaching programme on knowledge regarding selected essential vitamins among postnatal mothers in a rural area of Mehsana, Gujarat. The findings are discussed below in relation to similar studies.

The study revealed that a majority of postnatal mothers had inadequate knowledge regarding essential vitamins in the pre-test, with 48% demonstrating poor knowledge. This finding aligns with previous research showing low baseline nutritional knowledge among postnatal mothers in rural areas, largely due to limited health education and restricted access to maternal nutrition services (Black et al., 2013). Similar observations were reported by Saraswati et al. (n.d.), who found that postnatal women often lacked awareness regarding essential nutrients and appropriate dietary practices, which could adversely affect maternal recovery and infant growth.10

Following the structured teaching programme, the post-test results demonstrated a significant improvement in knowledge, with 70% of mothers attaining good knowledge. This is consistent with studies by Imdad, Yakoob, and Bhutta (2011) and Girard and Olude (2012), which reported that maternal education and counselling significantly enhanced awareness about nutrition and improved health behaviors. The increase in mean knowledge scores from 12.4 ± 3.1 to 22.8 ± 2.4 ($p < 0.001$) further supports the effectiveness of structured educational interventions in improving maternal nutritional knowledge. These findings reinforce the importance of delivering organized, need-based educational programmes during the postnatal period, particularly in resource-limited settings.11

The study also examined the association between baseline knowledge and selected demographic variables. A statistically significant association was found with educational status, occupation, and source of health information. This finding is in agreement with previous studies that reported higher education and better

access to reliable health information were associated with greater awareness of maternal nutrition and supplementation practices (Black et al., 2013; Imdad et al., 2011). No significant association was observed with age, parity, or type of family, which is consistent with prior evidence suggesting that these variables may not directly influence maternal knowledge regarding vitamins (Saraswati et al., n.d.).12

Overall, the results of this study highlight that structured teaching programmes can effectively enhance knowledge regarding essential vitamins among postnatal mothers. These findings emphasize the role of nurses and healthcare professionals in providing focused nutritional education to improve maternal recovery, support lactation, and promote infant health. The study also underscores the importance of tailoring educational interventions to address demographic factors, such as education and occupation, to maximize effectiveness in rural populations.[13]

CONCLUSION

The present study demonstrated that postnatal mothers in a rural area of Mehsana district, Gujarat, had inadequate baseline knowledge regarding selected essential vitamins. Implementation of a structured teaching programme significantly improved knowledge levels, as evidenced by higher post-test scores and statistically significant t values. Educational status, occupation, and access to reliable health information were identified as important factors influencing baseline knowledge. The findings highlight the importance of structured educational interventions in enhancing awareness about essential vitamins, promoting optimal maternal recovery, supporting lactation, and improving infant health outcomes. These results underscore the need for ongoing nutrition education and counselling for postnatal mothers, particularly in rural settings with limited access to health resources.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this study. The study was conducted independently, and no financial or personal relationships influenced the results or interpretation of data.

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