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A Study to Assess the Effectiveness of Structured Teaching Programme on Knowledge Regarding Immune Boosting Diet Among Adolescent in Selected School of Jagdalpur, Chhattisgarh

Shinky Das[1*], Swarnlata Peter[2], Pooja Netam[3]
[1]*M.Sc. Nursing Final Year, Department of Medical Surgical Nursing, Government College of Nursing, Jagdalpur, Chhattisgarh, India*
[2]*HoD & Principal, Department of Medical Surgical Nursing, Government College of Nursing, Jagdalpur, Chhattisgarh, India*
[3]*Department of Medical Surgical Nursing, Government College of Nursing, Jagdalpur, Chhattisgarh, India*

***Abstract*: Nutrition is an input and foundation for the health and development, nutrition strengthens the immune system. The immune system protects the body from infection. A person with a weak immune system may be more prone for frequent infection. Nutrition status is the result of the complex intersection between the food we eat our overall state of health and environment in which we live short, food health and caring the pillar of well-being Adequate nutrition, a fundamental of any individual health is especially critical for Adolescent population because adolescent it is a period of moving from the immature childhood into the maturity of adulthood. It is a period of rapid revolutionary changes in the individual's physical, mental, moral, spiritual, sex and social outlook. A strong immune system helps to keep a person healthy. The immune system's demands for energy and nutrients can be met from exogenous sources i.e., the diet, or if dietary sources are inadequate, from endogenous sources such as body stores. Some micronutrients and dietary components have very specific roles in the development and maintenance of an effective immune system throughout the life course or in reducing chronic inflammation. Aim: The aim of the study was to assess the effectiveness of structured teaching programme on knowledge regarding immune boosting diet among adolescent in selected school of Jagdalpur (C.G.) Setting and Design: A quantitative research approach with pre-experimental research design was adopted for this study. The study focused on 60 adolescent students at Swami Vivekananda Government Excellence school Jagdalpur (C.G.) Material and Method: The research approach used for this study was quantitative approach. The research design was pre-experimental, one group pre-test post-test design. 60 students were selected for this study by using non-probability convenient Sampling technique. Data was collected with the help of Self- Structured Knowledge questionnaire. Results: Knowledge regarding immune boosting diet among adolescent students were analyzed using frequency and percentage. It is seen that out of and practice score there is moderately positive correlation. In pre-test among 60 student's majority 51 (85%) had average knowledge score, 9 (15%) had poor knowledge score and none of the students had good knowledge score regarding immune boosting diet. However, in post- test knowledge score was increase majority 38 (63.33%) had average knowledge score, 22 (36.66%) had good knowledge regarding immune boosting diet. The effectiveness of structured teaching programme on level of knowledge regarding immune boosting diet in which pre-test mean is 13.16 and mean post-test mean is 19.75. The standard deviation of pre-test is 2.25 and post-test is 4.72. It indicates that there is significant gain in knowledge score in post-test after the administration of structured teaching programme. Since the calculated "t" value is 9.76 is greater than the table value 1.96at P< 0.05 level of significance. The data significant that the calculated score is greater than table value was found to be significant at 0.05 level of significance. Conclusion: The study conducted that the structured teaching programme regarding Immune boosting diet was effect in increasing the knowledge of adolescent students at Swami Vivekananda Government Excellence school Jagdalpur (C.G.).**

***Keywords*: Assess, Effectiveness, Structured teaching programme, Knowledge, Immune boosting diet, Adolescent students, Selected areas.**

1. Introduction

The human body possesses multiple defense mechanisms against pathogenic invasion, and one such mechanism is the immune system, sophisticated network of cells, tissues, and organs that collaborate to shield the human body from potential harm. Immunity is categorized into innate (nonspecific) and acquired (specific) types, where innate immunity provides immediate defense against harmful agents, while acquired immunity develops through interaction with specific invaders. It is more specialized than innate immunity, and it complements and enhances innate immunity's protection. A well-functioning immune system is critical for survival. The immune system must remain constantly vigilant, continuously monitoring for signs of invasion or danger. Cells of the immune system must be able to distinguish self from non-self and furthermore discriminate between non-self molecules which are harmful (e.g., those from pathogens) and innocuous non-self molecules (e.g., from food). This special issue of nutrients examines the connection between diet, nutrients, and immune function.

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*Corresponding author: sayreenakhan2023@gmail.com

immune system protects the body from infection. A person with a weak immune system may be more prone for frequent infection. Nutrition status is the result of the complex intersection between the food we eat our overall state of health and environment in which we live short, food health and caring the pillar of well-being.

Broadly, cells of the immune system may be divided into those of the innate and those of the adaptive immune response. The innate response serves as the body's first line of defense against an invading pathogen. Cells of the innate immune response include phagocytes (e.g., macrophages and monocytes), neutrophils, dendritic cells, mast cells, eosinophils, and others. The innate response is rapid, but not specialized and is generally less effective than the adaptive immune response.

Adequate and appropriate nutrition is essential for all cells to function optimally, including immune cells. An activated immune system increases energy demand, especially during infections and fever. Optimal nutrition supports immune cell function, enabling effective pathogen responses while preventing chronic inflammation. Energy and nutrient needs are met through diet or, if insufficient, from body stores. Certain micronutrients and dietary components play key roles in immune development and function. For instance, arginine is crucial for nitric oxide production by macrophages, while vitamin A and zinc regulate cell division, ensuring a successful immune response.

Under nutrition significantly impairs immune function, whether due to food shortages in developing countries or malnutrition during hospitalization in developed nations. The severity of impairment depends on factors such as deficiency level, nutrient interactions, infections, and age. A single nutrient can have multiple immunological effects, as seen with vitamin E, which acts as an antioxidant, inhibits protein kinase C, and interacts with enzymes and transport proteins. Excessive intake of certain micronutrients can also harm immunity, such as iron supplementation increasing morbidity and mortality in malaria-endemic regions. While proper nutrition can treat immune deficiencies caused by poor intake, research explores whether specific nutrient interventions can further enhance immune function and prevent infections or chronic inflammatory diseases.

Mohit Ratre (2023), in a recent study conducted by Health Economic Times India, analyzed data from five million users across 16 cities and found a rise in low immunity cases among Indians. The percentage of people with low immunity increased from 7.1% to 12%, the highest in the last three years. Additionally, 13.5% of Indians were reported to be highly sensitive to allergic reactions, while 13.4% took medication to boost immunity. Overall, 20.8% of Indians suffer from low immunity, with Chandigarh being the healthiest city and Kolkata the least healthy.

Vishwakarma et al. (2022) emphasizes the significant impact of diet and nutrition on immune function. Our diet provides energy-giving nutrients that serve as building blocks, along with non-nutrients that, together with essential nutrients, regulate metabolism and critical bodily processes, including immune signaling. Consuming a nutrient-rich diet with immunomodulatory properties helps strengthen the immune system by supporting both innate immunity (macrophages, NK cells, and neutrophils) and acquired immunity (T cells and B cells). Conversely, inadequate nutrition can impair immune system development, leading to immune incompetence and increasing susceptibility to infections, allergies, and chronic inflammation.

A healthy diet is essential for maintaining and enhancing immunity, as immune cells require sufficient energy to function, while micro- and macronutrients regulate immune responses. While previous studies have reviewed the immunological roles of specific nutrients like vitamins, minerals, and fibers, the immune benefits of specific food items remain less explored. This highlights the importance of proper nutrition in supporting optimal immune function. Dietary components have been shown to prevent and treat diseases linked to immune dysfunction, including cancer and inflammatory conditions such as atherosclerosis, cystic fibrosis, rheumatoid arthritis, bronchial asthma, and fibromyalgia. This underscores the therapeutic potential of incorporating certain foods into the diet to support immunity and combat disease.

A. Objectives

1. To assess the pre-test and post-test level of knowledge regarding immune boosting diet among adolescent in selected school of Jagdalpur (C.G.).
2. To assess the effectiveness of structured teaching programme on level of knowledge regarding immune boosting diet among adolescent in selected school of Jagdalpur (C.G.).
3. To find out association between pre-test level of knowledge regarding immune boosting diet among adolescent with selected socio demographic variables.

B. Hypotheses

1. H_1: There will be significant difference between pre-test and post-test knowledge score regarding immune boosting diet.
2. H_2: There will be significant association between pre-test level of knowledge regarding immune boosting diet among adolescent with selected socio demographic variables.

C. Operational Definition

- *Assess*: In this study to evaluate the knowledge regarding immune boosting diet.
- *Effectiveness*: It refers to the structured teaching programme regarding immune boosting diet will improve the level of knowledge of adolescent student.
- *Structured teaching programme*: In this study structured teaching programme refers to teaching programme systematic prepared and conduct by researcher on knowledge regarding immune boosting diet among adolescents.
- *Knowledge*: In this study it refers to correct response of the adolescent students regarding immune boosting

diet in self-structured questionnaire.

- *Immune boosting diet*: Immune boosting diet are specific food such as vitamin, minerals that strengthening the body immune response.
- *Adolescent students*: In this study it refers to students who are between 14-19 years and studying in Swami Vivekanand Govt. Excellence School Jagdalpur (C.G.).

D. Sampling criteria

1) Inclusion Criteria

Adolescent students those who were,

- Studying in Swami Vivekanand Govt. Excellence School Jagdalpur (C.G.)
- Willing to participate in this study.
- Cooperative during study period.
- Present during the study period.

2) Exclusion Criteria

Adolescent students those who were,

- Not willing to participate in the study.
- Not present at the time of data collection.
- Not Cooperative during study period.

2. Material and Method

The conceptual frame work adopted for the study is Stufflebeam's evaluation model. In this study pre-experimental research design was used for study. The tool includes socio demographic data and multiple-choice questionnaires to assess the knowledge regarding occupational immune boosting diet. The study was conducted on among 60 adolescent students from selected from Swami Vivekanand Govt. Excellence School Jagdalpur (C.G.). The sample size consists of 60 adolescent students. In the present study the target population is adolescent students. In this study the accessible population is the adolescent students from Swami Vivekanand Govt. Excellence School Jagdalpur (C.G.)

The sampling techniques adopted for this study was non probability convenience sampling technique. In the present study, independent was structured teaching programme on level of knowledge regarding immune boosting diet and dependent variable was knowledge level of students regarding immune boosting diet.

A. Description of the Tool

Data collection tools are the procedure or instruments used by the researcher to observe or measure the key variables in the research problem.

The self-administered questionnaire comprised of two sections.

Section-I: This consists of 13 Questions related to the demographic variables of the respondents about age, gender, year of studying, education of father, education of mother, occupation of father, occupation of mother, monthly family income, area of residence, dietary pattern, previous knowledge regarding immune boosting diet and source of information.

Section-II: This section consists of 30 multiple choice questionnaires with each 4 objective in each right answer 1 marks and in each wrong answer 0.

3. Result and Discussion

A. Distribution of Subjects According to the Socio-Demographic Variables

In present study, sociodemographic data elicit that among the study sample, 30(50%) students belong to 15 years of age, 33(55%) students were male, 52(86.66) were follow Hindu religion, 33 (55%) had studying in 10th standard, 42(70%) students father had secondary education , 39(65%) students mother had secondary education, 38(63.33%) students father were self-employee, 49(81.66%) students mother were house wife, 37(61.66%) family earn 10,001-20000 rs, 37(61.67%) students living in rural area, 28(46.66%) students were non vegetarian, 58(96.66%) had no previous knowledge regarding immune boosting diet.

B. Overall Analysis of Knowledge

It is seen that out of 60 students, distribution of subjects based on overall analysis of knowledge score in pre-test among 60 student's majority 51 (85%) had average knowledge score, 9 (15%) had poor knowledge score and none of the students had good knowledge score regarding immune boosting diet. However, in post-test knowledge score was increase majority 38 (63.33%) had average knowledge score, 22 (36.66%) had good knowledge regarding immune boosting diet.

Paired "t" test analysis to assess the effectiveness of structured teaching programme on level of knowledge regarding immune boosting diet.

Effectiveness of structured teaching programme on level of knowledge regarding immune boosting diet in which pre-test mean is 13.16 and mean post-test mean is 19.75. The standard deviation of pre-test is 2.25 and post-test is 4.72. It indicates that there is significant gain in knowledge score in post-test after the administration of structured teaching programme. Since the calculated "t" value is 9.76 is greater than the table value 2.00 at P< 0.05 level of significance. The data significant that the calculated score is greater than table value was found to be significant at 0.05 level of significance.

Table 1

Overall knowledge	Pre-Test				Post-Test			
	n	%	Mean	SD	N	%	Mean	SD
Poor knowledge (0-10)	9	15%	13.16	2.25	0	0%	19.75	4.72
Average knowledge (11-20)	51	85%			38	63.33%		
Good knowledge (21-30)	0	0%			22	36.66%		

Table 2

Level of knowledge	Mean	SD	Paired t value	DF	Table value	Significance
Pre-test	13.16	2.25	9.76	59	2.00	P< 0.05
Post-test	19.75	4.72				HS

Chi square analysis to find out association between knowledge score with selected socio demographic variables.

There is significant association found between religion ($\chi 2$= 11.22) is greater than the (P=7.82), occupation of mother ($\chi 2$= 8.44) is greater than the (P=7.82), and dietary pattern ($\chi 2$= 6.49) is greater than the (P=5.99) at 0.05 level of significance.

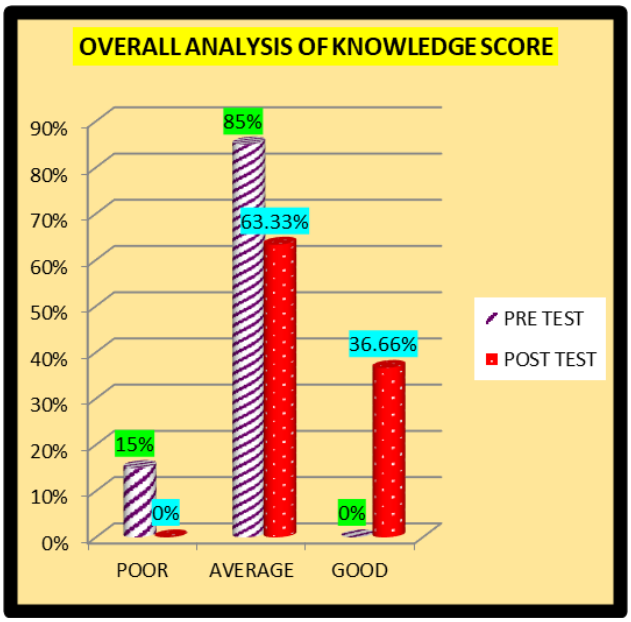

Fig. 1.

While no association found between age ($\chi 2$=3.06<P=7.82), gender ($\chi 2$=0.02<P=3.84), class ($\chi 2$=0.03<P=3.84), education of father ($\chi 2$=4.30<P=7.82),education of mother ($\chi 2$=2.67<P=5.99), occupation of father ($\chi 2$=1.97<P=7.82), Monthly family income ($\chi 2$=2.53<P=7.82), area of residence ($\chi 2$=3.32<P=3.84) and previous knowledge regarding immune boosting diet ($\chi 2$=1.98<P=3.84)at 0.05 level of significance.

1) Implication

Since the study reveals that there was a correlation between religiosity and positive mental among adult population. The findings of the present study have implication for nursing practice, nursing administration, nursing education and nursing research.

2) Nursing Practice

- The nurses are first point to the people in the hospital setting in any other setting with inpatient and outpatient. The nurse should be equipped with adequate knowledge regarding immune boosting diet. so that they would be able to impart knowledge to patients.
- The nurse educator needs to prepare charts and posters related to immune boosting diet which can be placed in the wards and educational departments.
- If a patient request information about immune boosting diet balanced and accurate information regarding the advantages of immune boosting diet.
- Nurses should be aware of the immune boosting diet and encourage the family members to eat immune boosting food.
- This study can necessitate and equip the nursing personnel to motivate and educate the community about immune boosting diet.
- Regular online workshop, conference, webinar should be organized to gain advance knowledge regarding immune boosting diet.

3) Nursing Administration

- Nursing administration should take care initiation in creating polices and plans in providing education people. Nurse administrator should plan and organize continuing nursing education in conducting programs on immune boosting diet.
- The nurse administrator should encourage the students and staff members to actively participate in conducting health education programme which is cost effective and convenient regarding immune boosting diet.
- Provide funds for conducting seminar, workshop and conferences. Encourage the staff to actively participate in in-service education programme regarding immune boosting diet.
- Administrators have to integrate this in their continuous education programme for their nursing staffs based on the topics immune boosting diet.
- The nurse administrator has the responsibility to provide a staff development programme for the nursing personnel regarding Nursing curriculum should include the current technologies to update the knowledge regarding immune boosting diet.
- Nurse administrators should explore nurses potential and encourage and motivate for educational material like leaflets, pamphlets, booklets, posters in order to create awareness regarding immune boosting diet.

4) Nursing Education

- Nursing curriculum should include the current technologies to update the knowledge regarding immune boosting diet.
- This study will help the nursing students to acquire knowledge regarding immune boosting diet.
- The findings will help the nursing students to give more importance for planning and organizing the self-structured questionnaire to improve the knowledge regarding immune boosting diet.
- Student nurses in the nursing colleges should be encouraged to conduct mass educational campaigns on immune boosting diet.
- Educative materials like hand-outs can be prepared by the nursing students to create awareness regarding effectiveness of structured teaching programme on knowledge regarding immune boosting diet.
- The clinical instructors can use the research findings in clinical teaching.
- The effectiveness structured teaching programme was much useful to enhance the knowledge level of students regarding immune boosting diet and can be used by students in practice.
- Nurse educators can organize workshop to increase

knowledge regarding immune boosting diet because in advancing scenario it's a needful concern.

5) *Nursing Research*

- Nursing research should be aware about the existing health care system and the |Status of the nursing profession. By conducting research and by formulating new theories, nurse could improve status their knowledge, skill and attitude by and improve the status and standard of nursing. There is a need for extensive nursing research on the immune boosting diet.
- This study motivates nursing personnel to do further studies related to this field.
- Promote more research activities on immune boosting diet.
- This study will be helpful to plan new interventional studies to improve the knowledge regarding immune boosting diet.
- Present study provides a tool to assess the effectiveness of structured teaching programme on level of knowledge regarding immune boosting diet.
- Findings can be used to determining the curriculum plans for future.
- The nurse use research findings in practice design to generate knowledge to guide nursing students to effectiveness of structured teaching programme.
- The nurses should be encouraged to upgrade their knowledge on the research findings related to immune boosting diet by other researchers so as to incorporate them in their clinical activities.

6) *Delimitation*

There were following limitation in the conducted study, discussed as follows:

- Only limited to Adolescent students
- Time period of study was limited.
- The size of the sample was only 60 subjects hence it is difficult to make broad organization.
- Who are present at the time of data collection.
- The study was limited in one group.

7) *Recommendations*

- The study can be repeated on the large sample for better generalization of the findings.
- The study can be replicated on a larger sample to generalize the results.
- The experimental study can be under taken with control group.
- A correlative study can be conducted on knowledge regarding immune boosting diet among parents.
- A similar study can be done with use of other teaching methods and teaching aids.
- Similar study can be conducted among family members to assess knowledge regarding immune boosting diet.
- A longitudinal study to assess the advantages of immune boosting diet in the reduction of flu and allergic problem.
- A similar study can be carried out by using different teaching strategies like pamphlet/ leaflet /booklet/ poster etc.

4. Conclusion

In the present study it shows that in pre-test there was poor and average level of knowledge regarding immune boosting diet. But after the administration of structured teaching programme knowledge level was increased it depicted by post-test score. Hence it shows that there is structured teaching programme is effective to increase the level of knowledge regarding immune boosting diet among adolescents population.

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