Effect Of Information Booklet On Knowledge Regarding Omega -3 Fatty Acid Benefit In Health Among Nursing Students Of Selecting Nursing Colleges

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Abstract

Background: Omega-3 fatty acids play a vital role in maintaining cardiovascular, neurological, immune, and inflammatory health. Despite their well-established benefits, awareness and knowledge regarding omega-3 fatty acids among nursing students remain inadequate, which may affect future patient education and health promotion practices.

Objectives: The study aimed (1) to assess the existing knowledge regarding the health benefits of omega-3 fatty acids among nursing students, (2) to evaluate the effectiveness of an information booklet/self-instructional module on improving their knowledge, and (3) to determine the association between post-test knowledge scores and selected demographic variables.

Methods: A quantitative pre-experimental one-group pre-test and post-test research design was adopted. The study was conducted among 100 nursing students selected using a non-probability convenient sampling technique from selected nursing colleges. Data were collected using a structured knowledge questionnaire covering meaning, sources, types, functions, and health benefits of omega-3 fatty acids. After the pre-test, an information booklet/self-instructional module was administered, and a post-test was conducted on the seventh day. Descriptive and inferential statistics, including paired *t*-test and chi-square test, were used for data analysis.

Results: The pre-test findings revealed that the majority of nursing students had average (74%) to poor (17%) knowledge regarding omega-3 fatty acids, with a mean score of 9 ± 2.7. Following the intervention, post-test results showed a marked improvement, with 80% of

students achieving very good knowledge and a mean score of 19 ± 2.5. The paired *t*-test demonstrated a statistically significant improvement in knowledge ($t = 27.02$, $p < 0.001$), confirming the effectiveness of the information booklet. Significant associations were observed between post-test knowledge scores and type of family as well as previous knowledge of omega-3 fatty acids.

Conclusion: The study concluded that the information booklet was highly effective in enhancing knowledge regarding omega-3 fatty acids among nursing students. Incorporating structured educational interventions on essential nutrients like omega-3 fatty acids into nursing curricula can strengthen students' nutritional knowledge and improve future patient education and preventive health practices

Introduction

Omega-3 fatty acids are a polyunsaturated fat that play a crucial role in human body maintenance. Due to its essential elements and bioactive properties, such as anti-inflammatory and involved in the neurological, cardiovascular, and immune system, research and public interest have increased over the last few decades .For 90 years, fatty acids have been involved in research, and it has been intensified in recent years. As essential components of plasma membrane phospholipids, fatty acids play unique functions in metabolism, healthy operation, and cell signaling. Numerous biological functions may be impacted by the amount and composition of certain fatty acids. The fluidity, permeability, and overall shape of the membrane, which allow the cell to regulate what enters and exits, are all maintained by the fatty acid compositions of different cells .

For vegetarians and vegans, who may not consume fish or other marine sources of omega-3s, achieving adequate intake can be challenging. Plant-based sources of ALA, such as flaxseeds, chia seeds, and walnuts, are important dietary components. However, due to the low conversion rate of ALA to EPA and DHA, algae-based supplements that provide direct sources of EPA and DHA are highly recommended for these populations. Research has shown that these supplements can effectively raise blood levels of EPA and DHA, similar to fish oil supplements. Incorporating omega-3 fatty acids into the diet can be done through various practical approaches. Regular consumption of fatty fish, inclusion of ALA-rich plant foods, and the use of omega-3 supplements when necessary are all effective strategies. Additionally, many food products are now fortified with omega-3s, providing convenient options to boost intake. [1]

Cardiovascular diseases (CVDs) are the leading cause of mortality worldwide. Among various dietary components, omega-3 fatty acids have garnered significant attention for their potential cardio protective effects. Omega-3 fatty acids, particularly eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), are primarily found in fatty fish and fish oil supplements. Alpha-linolenic acid (ALA), another omega-3 fatty acid, is present in plant sources like flaxseeds and walnuts.

For the general population, the American Heart Association (AHA) recommends consuming fatty fish at least twice a week. This translates to an intake of approximately 500 milligrams (mg) per day of combined eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), the two most crucial omega-3 fatty acids found predominantly in marine sources. Fatty fish such as salmon, mackerel, sardines, and herring are particularly rich in EPA and DHA. In addition to marine sources, plant-based sources such as flaxseeds, chia seeds, walnuts, and canola oil

provide alpha-linolenic acid (ALA), another omega-3 fatty acid that can be partially converted to EPA and DHA in the body, although this conversion rate is relatively low.

- **Omega-3 fatty acids play a protective role in cardiovascular disease by reducing inflammation, lowering triglycerides, and improving heart rhythm stability.** They are especially beneficial for individuals at risk of coronary artery disease and those already on statin therapy. Cardiovascular diseases (CVDs) are the leading cause of death globally.
- An estimated 19.8 million people died from CVDs in 2022, representing approximately 32% of all global deaths. Of these deaths, 85% were due to heart attack and stroke.
- Over three quarters of CVD deaths take place in low- and middle-income countries.
- Out of the 18 million premature deaths (under the age of 70) due to non communicable diseases in 2021, at least 38% were caused by CVDs.
- Most cardiovascular diseases can be prevented by addressing behavioral and environmental risk factors such as tobacco use, unhealthy diet (including excess salt, sugar, and fats) and obesity, physical inactivity, harmful use of alcohol and air pollution.
- It is important to detect cardiovascular disease as early as possible so that management with counselling and medicines can begin.

Need

The Dietary Guidelines for Americans suggest a daily intake of about 1.1 grams of ALA for adult women and 1.6 grams for adult men. While ALA is beneficial, direct consumption of EPA and DHA is more effective in ensuring the body's omega-3 needs are met due to the limited conversion efficiency of ALA to EPA and DHA. Therefore, incorporating both plant-based and marine sources into the diet is recommended to achieve a balanced intake of omega 3 fatty acids Individuals with existing cardiovascular conditions or those at high risk for cardiovascular disease may benefit from higher intakes of omega-3 fatty acids. Clinical studies have demonstrated that omega-3 fatty acids can significantly reduce the risk of cardiovascular events such as heart attacks and strokes. For example, the GISSI-Prevenzione trial and the JELIS trial both reported significant reductions in cardiovascular mortality and major coronary events with omega-3 supplementation.

Conclusion Omega-3 fatty acids are a necessary dietary source for maintaining optimal body health in human beings. These are present in flaxseeds and fatty fish in general and have an impact on heart health, brain health, irritability, and cerebrum function. This study supports the evidence for their role in cardiovascular health benefits, neurological disorders, immune system regulation, and inflammatory control. Despite their benefits, proven in modern diets, regularly decreasing the adequate provision of Omega-3 fatty acids highlights the requirements of dietary choice and essential supplements. Understanding the critical sources, role, absorption, and therapeutic applications plays an important role in maximizing their health benefits. Moreover, the integration of Omega-3 fatty acids in broader public health policies and plans for individualized nutrition systems plays a significant role in disease control and overall human wellness.

STATEMENT :

Effect of information booklet on knowledge regarding omega -3 fatty acid benefit in health among nursing students of selecting nursing colleges .

All the hypotheses will be tested at 0.05 (5%) level of significance.

H0: There will be no the significant difference between effectiveness of information booklet on knowledge regarding omega -3 fatty acid benefit in health among nursing students after pre test and post test.

H1: There will be the significant difference between effectiveness effect of information booklet on knowledge regarding omega -3 fatty acid benefit in health among nursing students after pre test and post test.

OBJECTIVE

1. To assess existing knowledge regarding selected omega -3 fatty acid benefit in health among nursing students of selecting nursing colleges
2. To assess the effectiveness of information on knowledge regarding omega -3 fatty acid benefit in health among nursing students of selecting nursing colleges
3. To determine association between post test knowledge score with selected demographic variable variables.

A review of literature provides current theoretical and scientific knowledge about a particular problem, and resulting in synthesis of what is known and not known. A current can be kept in the practice by regularly searching the literature for information on topics of personal interest. Increasingly, nurses in clinical practice are conducting small studies on their unit which however requires the literature for information about previous studies relevant to clinical problem

In the present study, the literature review has been organized in categories under following headings:

A. Literature related to omega-3 fatty acid and health

Kristina N et stated that Omega-3 (ω-3) fatty acids, renowned for their multiple health benefits, are pivotal in managing hyperlipidemia by modulating lipid profiles. The comprehensive activity explores the indications for omega-3 fatty acids, elucidating their multifunctional actions in various cardiovascular conditions. In addition to their well-established lipid-lowering effects, these acids exhibit anti-inflammatory, antiarrhythmic, and vasodilatory properties, influencing atherosclerotic processes and cardiac rhythm regulation. Additionally, the activity will discuss contraindications, emphasizing safe utilization.

Cardiovascular diseases (CVDs) constitute a worldwide health crisis, accounting for an anticipated 18 million deaths annually. The growing occurrence of lifestyle-associated threat elements, which include poor weight loss plan, sedentary behavior, and continual pressure, has contributed drastically to this burden. Omega-3 fatty acids have emerged as an herbal and effective intervention for reducing the risk and progression of CVDs. Their multifaceted benefits encompass lipid regulation, blood pressure reduction, anti-arrhythmic outcomes, and anti-inflammatory actions, making them a cornerstone of preventive cardiology (Lai et al., 2015).

DHA does this via lowering the buildup of beta amyloid plaque and regulating neuro inflammation and oxidative stress. They are naturally classified into eight major classes: fatty acyls, glycolipids, glycerophospholipids, sphingolipids, movement lipid polyketides, isoprenoids, and sterols. Three basic lipids are detected by the focused sensory system: cholesterol, glycerophospholipids, and sphingolipids. The improvement of better mental capacities in monkeys is linked to a very distinct component of the lipids within the brain

(Lange, 2020).

To gain the vision-keeping benefits of Omega-3 fatty acids, incorporating them into the food plan or the use of supplements is critical. People who are at risk for AMD, DES, or other eye conditions are often advised to take omega-3 supplements that contain at least 500–1000 mg of combined EPA and DHA each day to reduce the effects of the eye conditions (Dave et al., 2022).

The behavior and properties of several immune cells are influenced by omega-3 fatty acids, which enhance their capacity to control infection. Omega-3 unsaturated fats intervene in the polarization of macrophages toward a calming M2 aggregate, which plays a role in tissue repair and disease prevention. M1 macrophages are associated with a favorable pro inflammatory profile that contributes to some inflammatory disorders (Kolb, 2022)

B. Literature related to knowledge level among students

Rani & Thomas (2020) clearly demonstrates that nursing students possess inadequate knowledge about dietary fats, particularly essential fatty acids. Less than **30%** correctly identified EFAs as essential for **cardiovascular health**, specifically in reducing triglycerides, inflammation, and arrhythmia risk. Only **25%** recognized the role of EFAs in **neural function**, including brain development, cognitive functioning, and neurotransmission. The very low awareness of omega-3's cardiovascular and neurological benefits reinforces the need for **evidence-based educational interventions**, such as information booklets or structured teaching programs. This study provides strong justification for conducting research on improving knowledge levels using educational tools among nursing students.

Almoraie (2019) conducted a cross-sectional study among Saudi nursing students and reported that only 27% of participants possessed adequate knowledge regarding essential fatty acids. Significant gaps were observed in understanding dietary sources, recommended intake, and the physiological roles of EFAs. The author emphasized the urgent need for structured educational interventions, including supplemental materials and enhanced curriculum integration, to improve students' competency in nutrition-related topics. The study emphasized the need for structured educational interventions and supplemental materials.

Sakamoto et al. (2018) studied awareness about omega-3 and omega-6 fatty acids among Japanese nursing students. Results showed that **over 60%** were unaware that EPA and DHA are derived primarily from marine sources, and two-thirds could not correctly state their physiological role.

C. Literature related to effectiveness of information booklets

Sudhakaran et al. concluded that Nursing students possess **inadequate knowledge** regarding omega-3 fatty acids and their subtypes .Misconceptions about dietary sources and physiological importance were common. The deficiency in knowledge may impact. Their future patient education Dietary counselling Preventive cardiology strategies in clinical practice. The study reported that **over 70%** of nursing students did **not know the difference** between: **ALA (Alpha-linolenic acid)** – plant-based omega-3, found in flaxseed, soybeans, walnuts.**EPA (Eicosapentaenoic acid)** – marine omega-3, found in fatty fish **DHA (Docosahexaenoic acid)** – marine omega-3, essential for brain and retinal development

The authors recommended **structured nutrition modules, educational booklets, and student-focused training programs** to strengthen evidence-based nutrition knowledge.

Research methodology

The methodology of research indicates the general pattern of organizing the procedure for gathering valid and reliable data for the purpose of investigation. The steps undertaken for gathering and organizing the data collected were; research approach, research design, setting, population, sample and sampling techniques, criteria for selection of samples, development and description of tools, pilot study, data collection and plan for data analysis.

1.1 Research approach: In this study Quantitative approach was used

1.2 Research Design: In this study the design used is pre experimental one group pre test and post test research design with the objective of assessing the effectiveness of self instructional module on knowledge regarding omega3 fatty acids among nursing students

1.3 RESEARCHDESIGN

Variables: According to Polit and Hungler, variable is an attribute of a person or an object that varies, that it takes adifferent value. Two types of variable are identified in the study they are dependent variables and independent variables

Dependent variable: In this study, dependent variable is – knowledge regarding omega 3 fatty acid among college students

Independent variable: Independent variable in this study is – self instructional module

Population: The population in this study is all nursing college students .

Target population: In this study the target population includes all the nursing college students

Accessible population: In the present study the accessible population includes the nursing college students in selected schools of the city.

Sampling

Sampling technique: In this study non – probability convenient sampling technique was used in which a sample is choice of investigator with regard to the characteristic required under investigation

Sample: In this study the sample consist of 100 nursing students of selected college of the city

Sample size: Sample size consist of 100 nursing e students of selected college of the city.

Sample selection criteria: The samples were selected with the following set criteria:

Inclusion Criteria:

The college students who are:

Available at the time of data collection.

Studying in selected college of the city

Exclusion Criteria:

The nursing college students who are:

Not willing to participate in the study.

Who have under gone teaching program on omega 3 fatty acids.

Who have taken omega 3 fatty acid supplement .

Tools Preparation:- preparing of the tool was done by the following methods

Development of Tool:-

LITERATURE REVIEW: Previous research studies from books, journals and internet were referred.

EXPERTS OPINION: It was discussed with 11 experts from various fields including

nutritional , experts, Medical Surgical Nursing experts; subject expert, Statistician and Professors of MET unit and their valuable suggestions were incorporated in tools Technique Data collection technique are based on objectives and described systematically. Questionnaire technique was used as the research tool.

Description of Tools: The various techniques of data gathering involve the appropriate recording forms. These are called tools or instruments of data collection.

The investigator developed the tool necessary for the study after updating the theoretical knowledge regarding omega 3 fatty acids guidance from the experts and along with the review of literature.

Section A: It consist of demographic variables of the nursing students
        1. Age
        2. type of family
        3. place of residence
        4. type of dietary pattern .
        5. previous knowledge of omega 3 fatty acids
        6. if yes

Section B: It consists of questionnaire on knowledge regarding omega 3 fatty acids It was further subdivided into knowledge about meaning, incidence, types, functions and important , general recommendation

Each question carries 1 mark. Total number of questions was 30.

Total score was out of 30.In the self structured questionnaire each question had four options of which 3 were distracters and one is the correct response. For each correct answer score was given 1. For each wrong answer score was given 0. The total highest score that can be gained is 30.

SCALING: Refers to the procedure by which number or score is assigned to various degrees of answers.

Grading for knowledge score:-
        Poor - 0-6
        Average - 7-12
        Good - 13-18
        Very good - 19-24
        Excellent - 25-30

PREPARATION OF BLUE PRINT:-A blue print was prepared prior to the construction of the questionnaire which showed the distribution of the items according to the content area as well as knowledge and psychomotor domains.

PREPARATION OF SELF INSTRUCTIONAL MODULE

Self instructional module was prepared by the researcher which included all the basic points on omega fatty acid that need to be conveyed to the sample which was also based on blue print. SIM was also validated by the experts and necessary corrections were made.

FEASIBILITY OF THE STUDY:- It is a small scale test to determine the feasibility of the larger study. The investigator did not find much difficulty in getting the subjects because accessible population and sample size was 100 with respect to the inclusive criteria.

PILOT STUDY:A pilot study referred to a small scale preliminary try out of the method to be used in an actually large study, which acquaints the researcher with problems that can be corrected in proportion for the large research study or is done to provide the researcher with an

opportunity to try out the procedure methods, and tools of data collection.

RELIABILITY:-Reliability is the degree of consistency and accuracy with which an instrument measures the attribute for which it designed

to measure.

In this study, the reliability of the tool was determined by administering the questionnaire to six samples. Karl Pearson

correlation coefficient formula was used for reliability. The questionnaire was said to be reliable if the correlation coefficient was more than 0.8.The correlation coefficient „r‟ of the questionnaire was 0.89, which is more than 0.8. Hence the questionnaire was found to be reliable.

DATA COLLECTION METHOD:-

Permission was obtained from the principal of the college Before giving the questionnaire self introduction was done by the investigator and the purpose of the study was mentioned. Consent of the samples was taken.Pre test was conducted by Self structured questionnaire Self instructional module on knowledge regarding omega 3fatty acid was given .On the seventh day post test was taken for knowledge with the help of questionnaire.

PLAN FOR DATA ANALYSIS:-The data analysis was planned to include descriptive and inferential Statistics. The following plan of analysis was developed with opinion of experts. The analysis was to be done based on the objectives and hypothesis to be tested. The demographic data was to be analyzed in terms of descriptive statistics.

The investigator planned to analyze the data in the following manner.

A) Demographic data to be analyzed using frequency, percentage, unpaired„t‟ test and one way analysis of variance (fisher‟s exact test) and presented in the form of tables and graphs.

B) Data from the questionnaire before and after the administration of self instructional module to be analyzed using frequency, percentage and paired „t‟-test and presented in the form of tables and graphs.

RESULTS

SECTION I :PERCENTAGE WISE DISTRIBUTION OF ADOLESCENT GIRLS WITH REGARDS TO

SELECTED DEMOGRAPHIC VARIABLES.

This section deals with distribution of college study in selected college of the city with regards to their demographic variables. A convenient sample of 100 subjects was drawn from the study population. The data obtained to describe the sample characteristics including Age, Religion, place of residence, type of dietary pattern ,previous knowledge of omega 3 fatty acids , if yes awareness of the term " omega 3 fatty acids " and source of information respectively.

Table IV.1: Percentage wise distribution of college students according to their

selected demographic variables   n=100

Demographic variable	Frequency	Percentage
Age		
a.>19yrs	10	10%
b.20-21yrs	78	78%

c.above 22yrs	12	12%
Area of living		
a. Rural area	46	46%
B .Urban area	54	54%
Type of family		
a. Nuclear	78	78%
b. Joint	22	22%
Type of dietary pattern		
a. vegetarian	43	43%
b. non vegetarian	50	50%
C. others	7	7%
Previous knowledge of omega 3 fatty acid		
a. no	90	90%
b. yes	10	10%
If yes source of information		
a. friend and family	3	30%
b. health care	0	
c. social media	7	70%
d. newspaper	0	

Distribution of nursing e students according to their age in years shows that maximum that is 78 (78%) of them were in the range 20-21year .

Distribution of nursing students according to their area of living reveals that 46 (46%) of them were rural area and 54(41.7%)were urban area .

Distribution of nursing students according to their type of dietary pattern shows that most of them that is 43 (43%) were vegetarian and50 (50%) were non vegetarian .

Distribution of nursing students shows that maximum 90(90%) were no and 10 (10%) were yes in previous knowledge.

Distribution of nursing students according to their sources shows that 3(30%) friend and family and 7(70%) were social media .

SECTION II

PART A: ASSESSMENT OF EXISTING KNOWLEDGE REGARDING OMEGA 3 FATTY ACID AMONG COLLEGE STUDENTS

This part deals with the assessment of existing knowledge regarding omega 3 fatty acid among nursing college students on selected college of the city. The level of knowledge is divided

under following heading of poor, average, good, very good and excellent.

Table IV. 2: Existing knowledge regarding omega 3 fatty acid among college students

n=100

The above table shows that in pre test 17(17%) of the nursing students were having **poor**

LEVEL	Pre test score		
	FREQUENCY	PERCENTAGE	
Excellent 25-0	0	0%	
Very good (19-24)	0	0%	Min=5 Max=15
Good 13-18	9	9%	
Average7-12	74	74%	
Poor<6	17	17%	
	Mean score is 9	S.D is 2.7	

level of knowledge, 74 (74%) had average and only 9(9%)% of them had good level of knowledge score. The mean score for the pretest was 9with SD of 2.71 . min score =5 and max score=15

PART B

ASSESSMENT OF POST KNOWLEDGE REGARDING OMEGA 3 FATTY ACID AMONG COLLEGE STUDENTS

This part deals with the assessment of post test knowledge regarding omega 3 fatty acid among nursing college students on selected college of the city. The level of knowledge is divided under following heading of poor, average, good, very good and excellent.

Table IV. 3: Post test knowledge regarding omega 3 fatty acid among

college students

n=100

The above table shows that in post test 1(1%) of the nursing college students were having

LEVEL	Post test score		
	FREQUENCY	PERCENTAGE	
Excellent 25-0	1	1%	Min=16 Max=25
Very good (19-24)	80	80%	
Good 13-18	19	19%	
Average7-12	0	0%	
Poor<6	0	0%	
	Mean score is 19	S.D is 2.5	

excellent of knowledge, 80 (80%) had very good and only 19(19%)of them had good level of knowledge score. The mean score for the post test mean score was19with SD of 2.5 . min score =19 and max score=25

SECTION III

Evaluation of effectiveness of SELF INSTRUCTIONAL MODULE ON KNOWLEDGE REGARDING omega 3 fatty acid among nursing college students

This section deals with the effectiveness of Self Instructional Module on knowledge regarding omega 3 fatty acid among college students on selected college of the city The hypothesis is tested statistically with distribution of pretest and posttest mean and standard deviation and mean difference. The levels of knowledge during the pretest and post test are compared to prove the effectiveness of Self Instructional Module (SIM). Significance of difference at 5% level of significance is tested with student''s paired„t'' test and tabulated „t'' value is compared with calculated „t'' value. Also the calculated „p'' values are compared with acceptable „p'' value i.e. 0.05.

Table IV.4: Effectiveness of self instructional module on knowledge regarding omega 3 fatty acid among nursing college students on selected college

n=100

Test	mean	SD	T valuve	Table value	Df	P value	Significance
Pretest	9	2.7	27.02	1.98	99	0.0000	Significant
Post test	19	2.5					

This table shows that there is a significant difference between pretest and post test knowledge scores interpreting effective self instructional module on knowledge regarding omega 3 fatty acid among nursing college students on selected college of the city. Mean and standard deviation values are compared and paired „t‟ is applied at 5% level of significance. The tabulated t-value for n=99 i.e99 degrees of freedom was 1.98. The calculated „t‟ value are 27.02 much higher than the tabulated value at 5% level of significance for all the areas of knowledge score which is statistically acceptable level of significance. Hence it is statistically interpreted that the Self Instructional Module on knowledge regarding omega 3 fatty acid among college students was effective. Thus the H1 is accepted.

Section II: Association of knowledge score in relation to selected demographic variable

Variable	Chi Square	d.f.	Table value	Significance
Age in years	3.58	4	9.49	Not Significant
Area of living	4.295	2	5.99	Not Significant
Type of family	8.17	2	5.99	**Significant**
Type of dietary pattern	3.58	4	9.49	Not Significant

Previous knowledge of omega 3 fatty acid	6.645	2	**5.99**	**Significant**
Source of information	1.12	2	5.99	Not Significant

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