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"A Study To Assess The Effectiveness Of Structured Teaching Program On Knowledge Regarding Prevention Of Computer Vision Syndrome Among 4th Year B.Sc. Nursing Students In Asram Nursing College At Eluru''

PREVENTION OF COMPUTER VISION SYNDROME

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ABSTRACT

Background: Computer Vision Syndrome (CVS) is a growing concern among students due to prolonged exposure to digital screens. This study aimed to assess the effectiveness of a structured teaching programme on knowledge regarding CVS prevention among 4th-year B.Sc. Nursing students, considering selected demographic variables.

Methodology: A pre-experimental one-group pre-test and post-test design was adopted. Ninety students were selected using purposive sampling. A structured questionnaire assessed pre-test knowledge, followed by a structured teaching session. A post-test using the same tool was conducted after seven days. Data were analyzed using descriptive and inferential statistics, including Chi-square tests.

Results: Most Students were 21 years old (52.2%) and from nuclear families (80%). A majority (62.4%) reported using computers for over 3 hours daily. In the pre-test, 75.5% had inadequate knowledge, 22.2% had moderate knowledge, and only 2.2% had adequate knowledge. Post-test results showed significant improvement: 73.3% had adequate knowledge, 16.6% had moderate knowledge, and 10% remained in the inadequate category. Significant associations were observed between post-test knowledge and type of family ($\chi^2 = 14.3$, DF = 4), mother's occupation ($\chi^2 = 31.3$, DF = 4), and duration of computer use ($\chi^2 = 18.4$, DF = 4), all above the table value of 9.49. Non-significant associations included age ($\chi^2 = 3.70$, DF = 4), father's occupation ($\chi^2 = 7.72$, DF = 6), family income ($\chi^2 = 5.6$, DF = 6), hobby ($\chi^2 = 1.66$, DF = 6), and reason for computer use ($\chi^2 = 12.2$, DF = 6).

Conclusion: The structured teaching programme significantly improved knowledge regarding CVS prevention. Continued awareness efforts are essential to promote healthy digital habits among students with high screen exposure.

Keywords: Structured Teaching Programme, Computer Vision Syndrome, Nursing Students, Knowledge Assessment, Chi-square Test

INTRODUCTION

In the modern world, the viewing of electronic displays has become a huge part of daily living at home, at work, during leisure time and the move. The use of laptop, desktop and tablet computers, smartphones and electronic reading devices has become ubiquitous. Without computer, world has no global awareness.[1]The computer has become backbone of today's occupational settings. From primitive tools of the stone age, today we have entered a new era, the computer age-an age which owes everything to inventors. It has created a brand-new environment. They are the heartbeats of the modern world. [2]

Computer Vision Syndrome (CVS), also known as digital eye strain, refers to a group of eye and vision-related problems caused by prolonged use of digital screens such as computers, tabs, and smartphones.[3]

In today's digital learning environment, nursing students rely extensively on screens for academic purposes, including online lectures, e-books, clinical simulations, and research work.

This prolonged screen exposure increases their risk of Computer Vision Syndrome (CVS), leading to eye strain, headaches, dry eyes, blurred vision, and musculoskeletal discomfort.[3]

Computer Vision Syndrome (CVS) can affect nursing students in their 4th year of a Bachelor of Science in Nursing (BScN) program due to the extensive use of digital devices for study, research, and clinical documentation it may impact on their eyes. Nursing students often spend hours reading electronic textbooks, reviewing patient records, and completing assignments online. Prolonged exposure to screens can lead to eyestrain, dry eyes, and blurred vision, all common symptoms of CVS.[4]

University students experience a higher prevalence of sleep disorders compared to the general population, with approximately 18.5% affected by insomnia. Sleep disturbances can negatively impact academic performance and contribute to the development of mental health issues such as anxiety, depression, and burnout. Furthermore, inadequate sleep in young adults may lead to medium- and long-term health consequences, including weight gain, persistent fatigue, and an increased risk of motor vehicle accidents.[5]

According to the American Optometric Association (AOA), the most common health complaints among computer workers are vision-related problems. The studies suggest its prevalence may be fifty to ninety percent among computer workers. These symptoms include eye strain, dry eyes, eye irritation, blurred vision and double vision. With more and more of us using a computer at work and smartphones for so many purposes, CVS is becoming a major public health issue. The AOA reports that a survey of optometrists found that approximately 10 million eye exams being performed annually for reasons related to computer vision syndrome.[6]

For those children without a personal home PC, friends often provide them with access to a computer, most commonly to play computer games. Today's youth learn to play computer games as an expected rite of development in our high-tech society. [7] These games help teach many of the basic skills and knowledge is necessary to use a computer, such as the use of the mouse and/or joystick, basic keyboard commands, starting and ending programs, and learning how to save and store files. Learning these basic skills enable youngsters to feel comfortable with computing and give them an ability to learn to use educational software more easily at school. [8]

60 million people worldwide experience vision issues due to digital screens, with millions of new cases annually and suffer from CVS globally143 million Americans work on computers daily, and 88% suffer from eye strai54 million children use computers daily for education, increasing CVS risk.135 million people globally are visually disabled, with 90% living in developing countries.Over 75% of young software professionals and college students in Bangalore suffer from CVS.[9]

High screen time in Visakhapatnam, Vijayawada, and Amaravati is leading to increased vision issues due to digital screens. The hot, dry climate worsens Computer Vision Syndrome (CVS) symptoms, causing eye strain, dryness, and fatigue. [10] Karnataka (Kolar District): Adults (18–45 years), including students and office workers, affected by frequent computer use. Telangana (Hyderabad): Young adults (20–40 years), mainly IT professionals, face CVS due to prolonged screen exposure.[11]

Management of Computer Vision Syndrome (CVS). A widely adopted clinical strategy includes optimizing the ergonomic arrangement of the computer workstation and encouraging users to follow the 20-20-20 rule—taking a 20-second break every 20 minutes to look at something at least 20 feet away.[12]

Polyunsaturated fatty acid (PUFA) supplements, containing omega-3 and/or omega-6 fatty acids, have been suggested as a treatment for dry eye. Omega-3 PUFAs are available in both short-chain forms, such as alpha-linolenic acid (ALA), primarily found in plant-based sources, and long-chain forms like eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), which are mainly derived from marine-

based foods. Omega-6 PUFAs are commonly found in vegetable oils, meats, and other animal-derived products.[13]

autologous serum eye drops (AS) offer a potential advantage over traditional therapies on the assumption that AS not only serve as a lacrimal substitute to provide lubrication but contain other biochemical components that allow them to mimic natural tears more closely. Application of AS has gained popularity as second-line therapy for patients with dry eye. Published studies on this subject indicate that autologous serum could be an effective treatment for dry eye.[14]

Over the counter (OTC) artificial tears historically have been the first line of treatment for dry eye syndrome and dry eye-related conditions like contact lens discomfort, yet currently we know little regarding the overall efficacy of individual, commercially available artificial tears. This review provides a much needed meta-analytical look at all randomized and quasi-randomized clinical trials that have analyzed head-to-head comparisons of OTC artificial tears.[15]

REVIEW OF THE LITERATURE

Rakhi Dandona 2002 conducted a descriptive study in Andhra Pradesh to assess moderate visual impairment. Out of 11,786 individuals sampled from urban and rural clusters, 10,293 (87.3%) participated. Moderate visual impairment—defined as visual acuity less than 6/18 to 6/60—had an adjusted prevalence of 8.09%. The main causes were refractive error (45.8%) and cataract (39.9%). Risk factors included older age, female gender, low socioeconomic status, and rural residence. Extrapolated nationally, 82 million Indians were affected in 2000, with projections of 139 million by 2020. The findings emphasize the need for targeted eye care strategies, especially for treatable conditions.[16]

Gadain Hassan HA 2023 conducted a cross-sectional study among 149 medical students at the University of Khartoum to assess the prevalence and contributing factors of computer vision syndrome (CVS). Using a structured online questionnaire and stratified random sampling, the study revealed that 94% of students experienced CVS symptoms, with neck/shoulder pain (78.5%) and headaches (70.5%) being the most common. Most students (81.2%) used electronic devices for over five hours daily, and 54.4% used them while lying down. Awareness of the 20-20-20 rule was low (18.1%), and 68% sat closer than the recommended 40 cm from screens. Poor posture significantly increased symptom severity (OR = 4.643; p = 0.004). The study highlighted a high CVS prevalence and emphasized the need for awareness and safe device usage practices. [17]

Naga Pravisha and K. Sravani2023, Lakshmi conducted a descriptive study to examine the prevalence and symptoms of computer vision syndrome (CVS) among software employees in Andhra Pradesh. The study included 500 Students aged 25 to 40 years, all of whom had at least two years of daily computer exposure for approximately eight hours. Data were collected using a validated structured questionnaire, and symptomatic individuals were further evaluated in the outpatient department of a tertiary care hospital. Clinical assessments included anterior segment examination with slit-lamp biomicroscopy, Schirmer's test, tear film break-up time, and posterior segment evaluation using a 90D lens. The results revealed that 72.6% of Students experienced eye strain, 65.3% had dry eyes, 52% reported headaches, and 49.3% suffered from eye watering and redness. The study concluded that CVS is highly prevalent among software professionals, emphasizing the importance of managing screen exposure and raising awareness about preventive measures to reduce the impact of CVS.[18]

CONCEPTUAL FRAME WORK

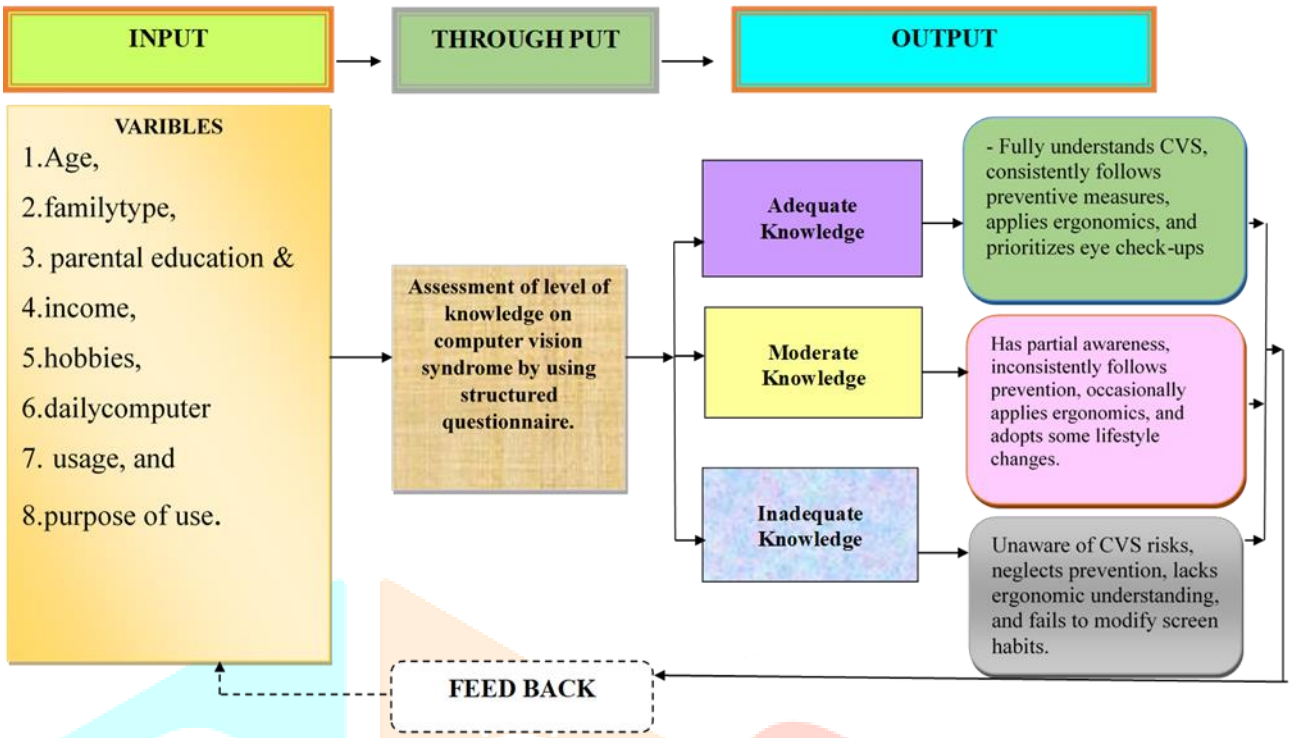


FIG:1 CONCEPTUAL FRAME WORK BASED ON MODIFIED LEUDWINGVON BERTALANFFY'S GENERAL SYSTEM THEORY (2024)

STATEMENT OF THE PROBLEM:

"A study to assess the effectiveness of structured teaching program on knowledge regarding prevention of computer vision syndrome among 4th year B.Sc. nursing students in Asram nursing college at Eluru.

OBJECTIVES OF THE STUDY:

1. To assess the pretest knowledge of 4th year BSc nursing students regarding computer vision syndrome.
2. To Administer structure teaching program on knowledge of 4th year BSc nursing students regarding prevention of computer vision syndrome.
3. To compare the pre-test and post-test knowledge regarding prevention of computer vision syndrome among of 4th year BSc nursing students.
4. To find out the association between post-test knowledge scores among of 4th year BSc nursing students and selected demographic variables

OPERATIONAL DEFINITION:

Assess: In this study it refers to find out the knowledge of adolescents regarding prevention of computer vision syndrome.

Effectiveness: In this study it refers to significant increase in the level of knowledge among adolescents regarding prevention of computer vision syndrome which is measured by pre-test, structured teaching program and post-test.

Structured teaching program: In this study it refers to lecture (30 mins) giving to of 4th year BSc nursing students regarding usage of computer, complications, precautions for prevention of computer vision syndrome.

Knowledge: In this study it refers to awareness of prevention of computer vision syndrome among of 4th year BSc nursing students

Prevention Computer vision syndrome: In this study it refers to a complex of eye and vision problem related to excessive exposure to computer and its use and preventive measures include minimize glare, adjusting of your computer screen, monitor display quality, blink more often, and exercises and stretch eyes.

4th year BSc nursing: Students enrolled in their fourth year of the Bachelor of Science in Nursing program.

HYPOTHESIS:

(H0): There is no significant difference in the knowledge regarding prevention of Computer Vision Syndrome (CVS) among 4th-year BSc nursing students before and after the structured teaching programme.

(H1): There is a significant improvement in the pre and post-test knowledge regarding prevention of Computer Vision Syndrome (CVS) among 4th-year BSc nursing students after completing the structured teaching programme.

(H2): There is a significant association between post-test level of knowledge and their selected demographic variables

ASSUMPTION:

1. 4th-year BSc nursing students may have some knowledge regarding prevention of computer vision syndrome.
2. Administration of structure teaching program may enhance the knowledge of 4th-year BSc nursing students on prevention of computer vision syndrome.

DELIMITATION:

- The study is limited to 4th-year BSc nursing students in Asram nursing college.
- The study is limited to 4 weeks.

RESEARCH METHODOLOGY

RESEARCH APPROACH

The research approach was adopted for this study is a quantitative approach.

RESEARCH DESIGN

The research design selected in this study is Pre experimental one group pretest and post-test research design.

SETTING OF THE STUDY

The study was conducted in the Asram nursing college, in 4th year BSc nursing class room.

DURATION OF THE STUDY

The study was conducted for a period of four weeks from 02.06.24 to 04.07.24

STUDY POPULATION

Target population

It comprises of 4th-year BSc nursing students who are studying in Asram nursing college

Accessible population

College students of 4th year those who are having computer knowledge.

SAMPLE

In this study, 4th BSc students who met the inclusion criteria were selected as samples.

SAMPLE SIZE

The sample size was 90 students studying in 4th year BSc nursing in Asram nursing college at Eluru.

Sample size calculation

$$n = \frac{Z^2 \cdot P \cdot (1 - P)}{d^2}$$

Assumptions:

- Confidence level (Z) = 1.96 (for 95%)
- Expected proportion (P) = 0.5 (50%)
- Margin of error (d) = 0.103 (10.3%)

Calculation:

$$n = \frac{(1.96)^2 \cdot 0.5 \cdot (1 - 0.5)}{(0.103)^2} \approx 90$$

Inclusion Criteria

- Students of 4th year BSc nursing those who are having computer knowledge.
- The students those who are willing to participate.
- The students those who are able to understand Telugu and English.

Exclusion Criteria

- Students of 4th year BSc nursing those who are not having computer knowledge.
- The students those who are not willing to participate.
- The students those who are not able to understand Telugu and English
- The absentees at the time of data collection.

SAMPLING TECHNIQUE

In this study Non-Probability Purposive Sampling Technique was used to select the subjects.

RESEARCH VARIABLES OF THE STUDY

Independent Variable

In the present study the independent variable is structured teaching programme on prevention of computer vision syndrome given by the investigator.

Dependent Variable

In the present study, knowledge of students regarding prevention of computer vision syndrome is the dependent variable which is assessed using the pre-test and post test scores.

Demographic variable

It includes age, type of family, education, income of parents, hobby, duration of computer uses per day and reason for computer use.

Description of tool

The tool for data collection consists of 2 sections

Section – I

It consists of demographic details of the school students which comprises of the items such as age, type of family, education, occupation and income of parents, hobby, duration of computer use per day and reason for computer use.

Section – II

It consists of 20 structured multiple-choice questions with three options. The concept included for developing the tools which includes questions related to basic knowledge regarding computer vision syndrome, questions related to causes and symptoms, questions related to preventive measures and questions related to eye exercises.

Structured teaching programme

Structured teaching programme regarding the computer vision syndrome, causes, risk factors, signs and symptoms of computer vision syndrome, preventive measures, exercises used to prevent computer vision syndrome and advantages of exercise.

SCORING INTERPRETATION

A structured questionnaire was used to assess the knowledge regarding Global warming and its effects on health.

It contains 20 multiple choice questions. Each correct answer was given a score of (1) one and wrong answer was scored as (0) zero. The total score was 20.

DESCRIPTION OF FREQUENCY AND PERCENTAGE DISTRIBUTION OF DEMOGRAPHIC VARIABLES.

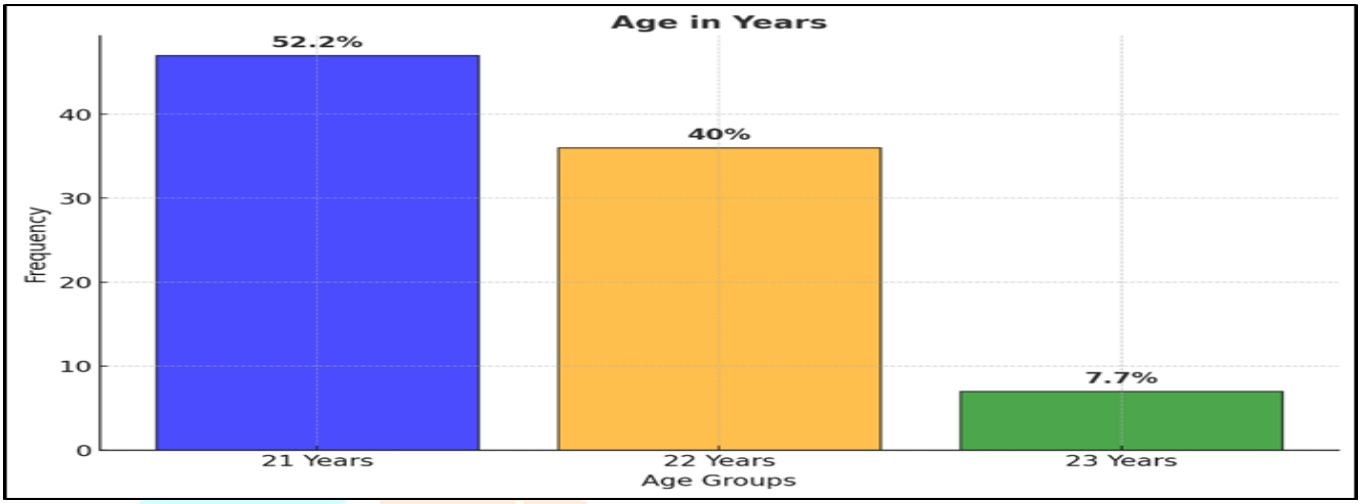
NO=90

S.NO	DEMOGRAPHIC VARIABLES	FREQUENCY	PERCENTAGE
1.	AGE IN YEARS		
	1. 21 YEARS	47	52.2%
	2. 22YEARS	36	40%
	3. 23 YEARS	7	7.7
	4. 24 YEARS	0	0
2.	TYPE OF FAMILY		
	1. NUCLEAR FAMILY	72	80%
	2. JOINT FAMILY	14	15.5%
	3. OTHERS	4	4.4%
3.	OCCUPATION OF THE FATHER		
	1. UNEMPLOYEE	31	34.4%
	2. PRIVATE EMPLOYEE	31	34.45
	3. FARMER	21	23.3%
	4. GOVT EMPLOYEE	7	7.7%
4.	OCCUPATION OF THE MOTHER	42	46.6%
	1. UNEMPLOYEE	46	51.1%
	2. PRIVATE EMPLOYEE	0	0
	3. FARMER	2	2.2%
	4. GOVT EMPLOYEE		
5.	MONTHLY INCOME OF FAMILY		
	1. 6000 TO 10000	21	23.3%
	2. 11000 TO 15000	26	28.8%
	3. 16000 TO 20000	24	26.6%
	4. ABOVE 40000	19	21.1%
6.	HOBBY		
	1. OUT DOOR GAMES	22	24.4%
	2. INDOOR GAMES	18	20%
	3. INTERNET CHATTING	14	15.5%
	4. MOVIES	36	40%
7.	DURATION OF COMPUTER USE	56	62.2%
	1. LESS THAN 3 HOURS	32	35.5%
	2. 3 TO 6 HOURS	2	2.2%
	3. MORE THAN 6 HOURS		
8.	REASON FOR COMPUTER USE	55	61.1%
	1. EDUCATION	5	5.5%
	2. GAMES	24	26.6%
	3. MOVIES	6	6.6%
	4. OTHERS		

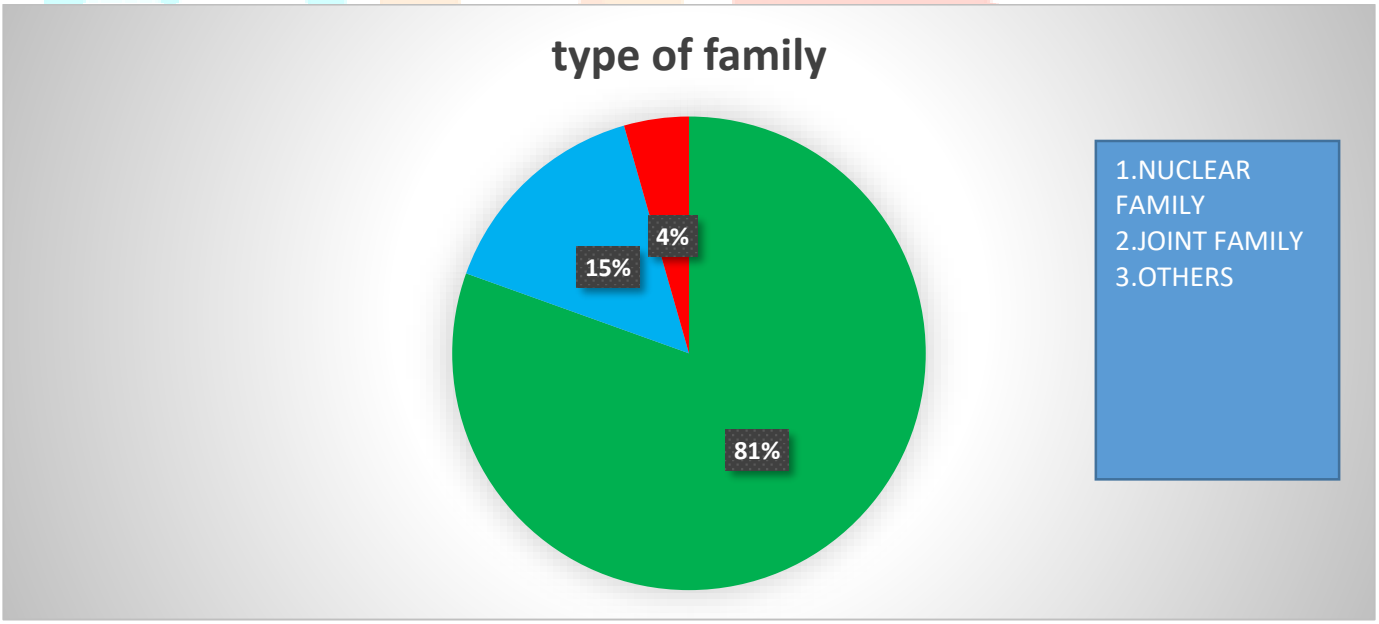
This section describes the description of demographic variables of the study population. Out of the total study population majority of samples 47(52.2%) belongs to 21 years of age.
majority of samples 72(80%) belongs to nuclear family.
Out of the total study population majority of father's occupation 31(34.44%) was unemployed second majority of the population are private employees 31(34.45%)
Out of the total study population majority of mother's occupation 46(51.5%) were private employees

Majority of the Students about 26(28.8%) were earning Rs11000 TO 15000 per month as family income.
Out of the total study population majority of samples 36(40%) have the hobbies of watching movies.
Out of the total study population majority of samples 56(62.4%) are using computer more than 3 hours.
Out of the total study population majority of samples 55(61.1%) were using the compute

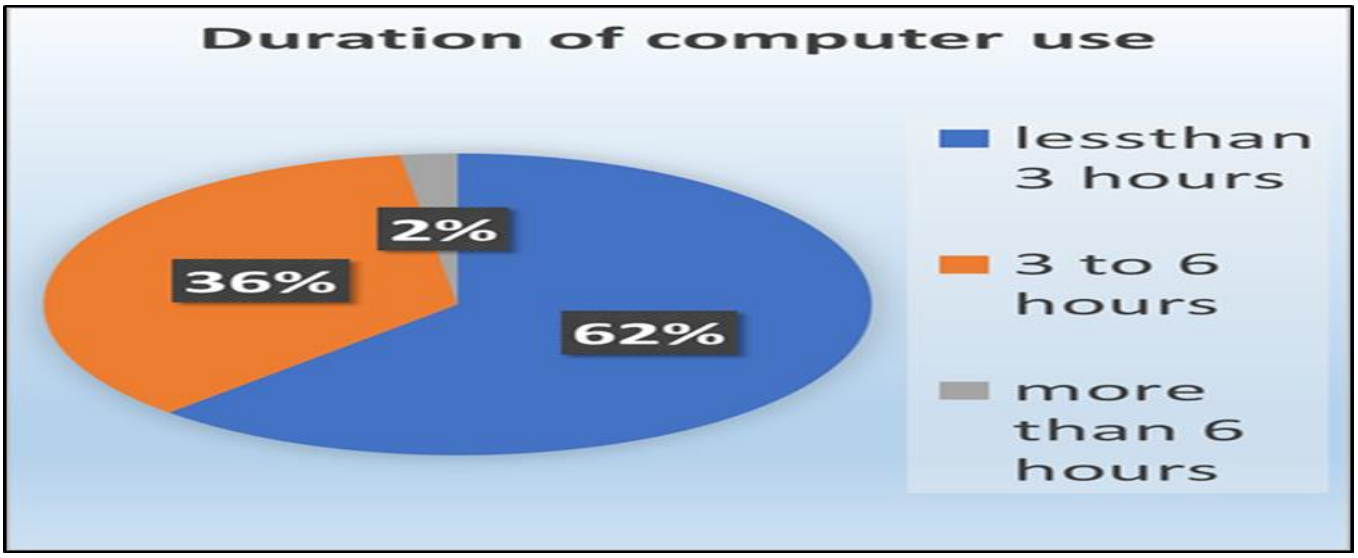
DESCRIPTION OF FREQUENCY AND PERCENTAGE DISTRIBUTION OF DEMOGRAPHIC VARIABLES ACCORDING TO THE AGE



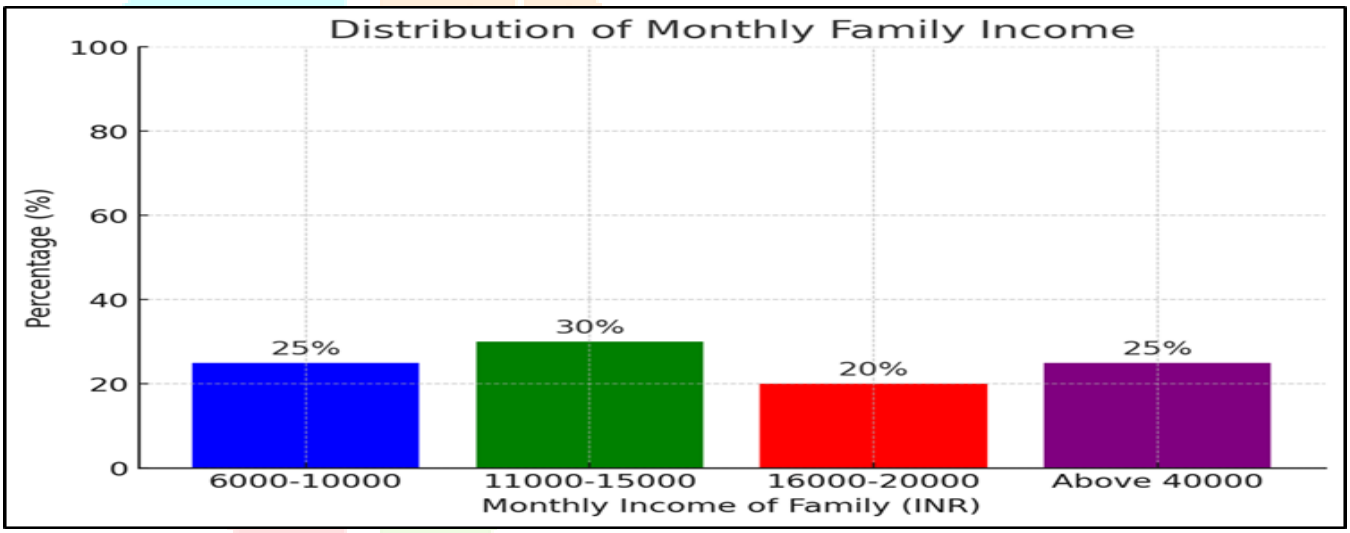
DESCRIPTION OF FREQUENCY AND PERCENTAGE DISTRIBUTION OF DEMOGRAPHIC VARIABLES ACCORDING TO THE TYPE OF FAMILY



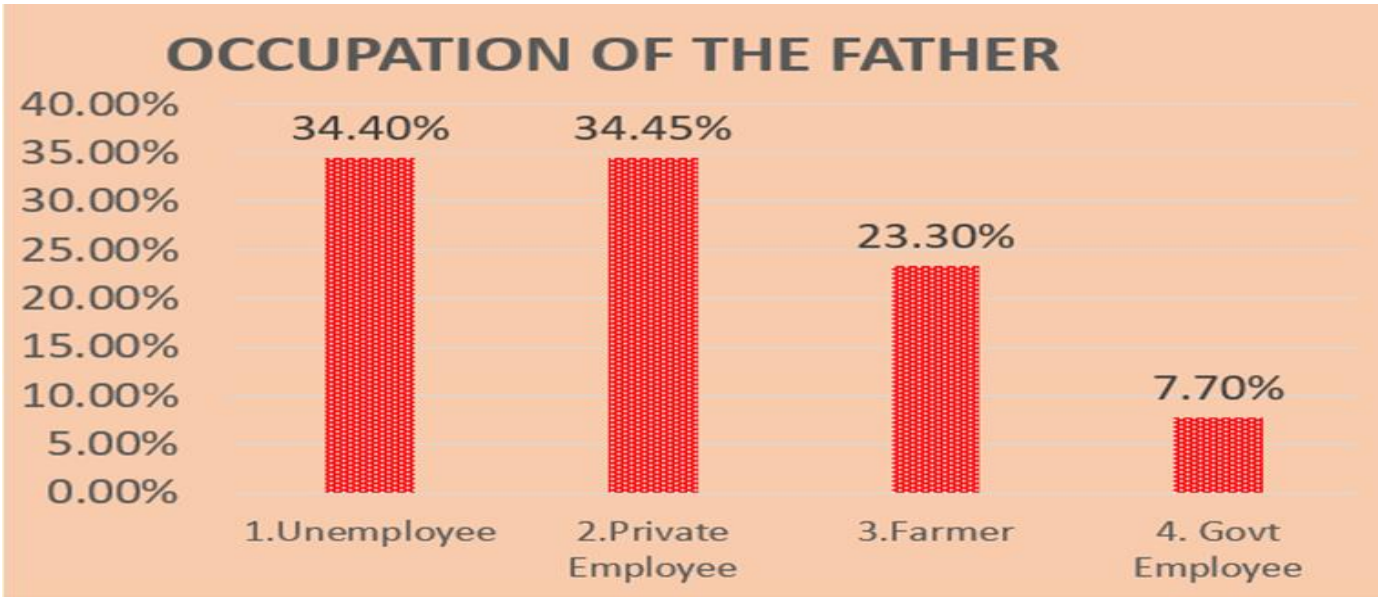
DESCRIPTION OF FREQUENCY AND PERCENTAGE DISTRIBUTION OF DEMOGRAPHIC VARIABLES ACCORDING TO THE DURATION OF COMPUTER USE



DESCRIPTION OF FREQUENCY AND PERCENTAGE DISTRIBUTION OF DEMOGRAPHIC VARIABLES ACCORDING TO THE FAMILY INCOME



DESCRIPTION OF FREQUENCY AND PERCENTAGE DISTRIBUTION OF DEMOGRAPHIC VARIABLES ACCORDING TO THE OCCUPATION OF THE FATHER



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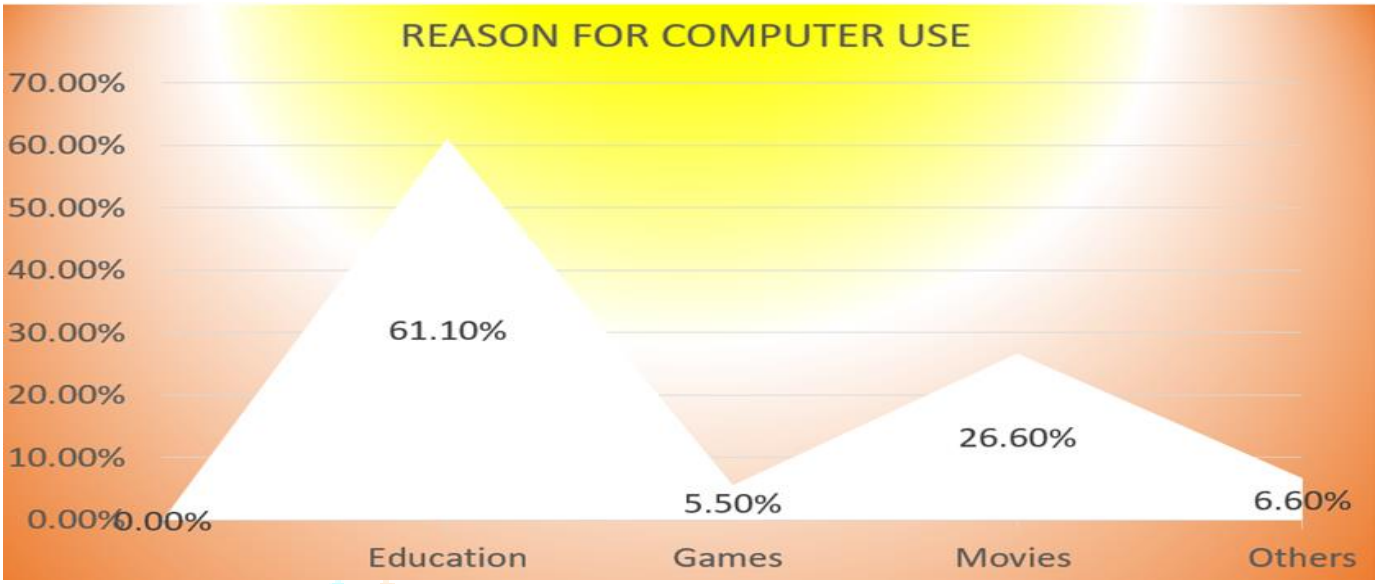
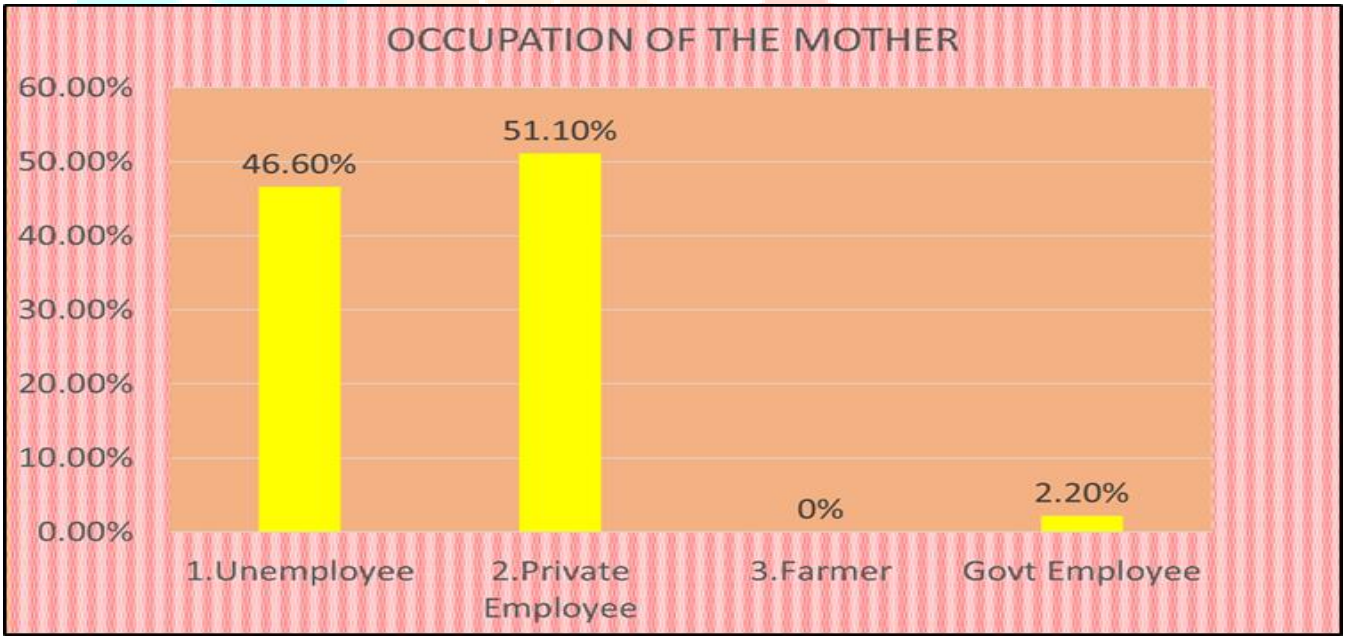


DESCRIPTION OF FREQUENCY AND PERCENTAGE DISTRIBUTION OF DEMOGRAPHIC VARIABLES ACCORDING TO THE OCCUPATION OF THE MOTHER



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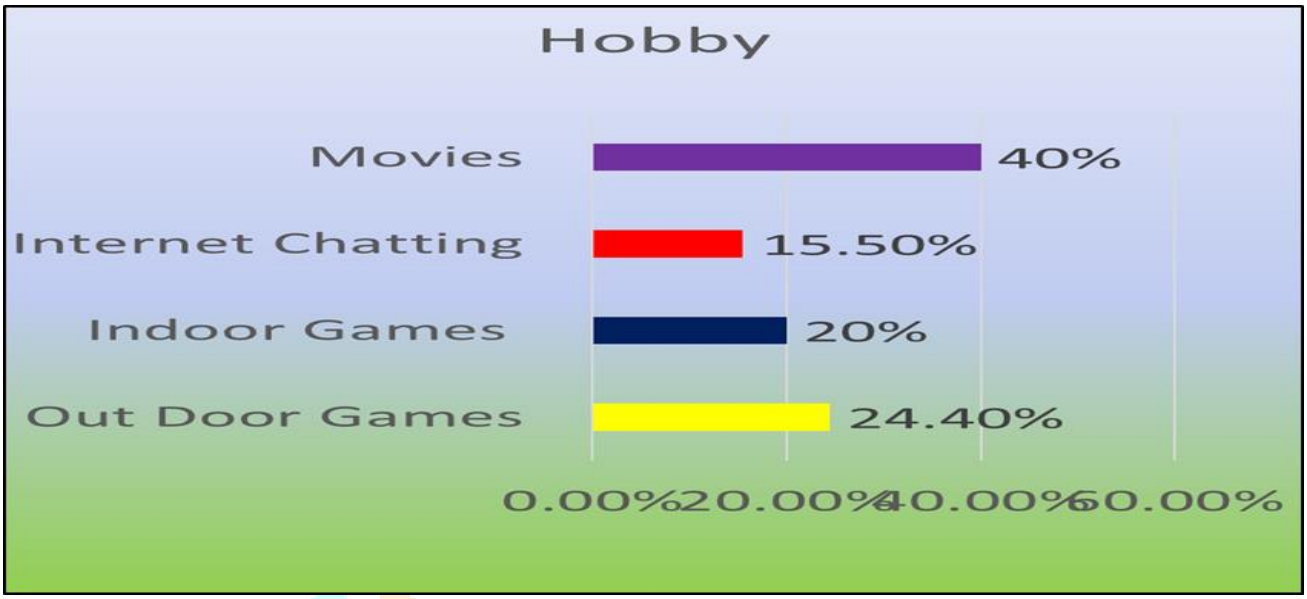
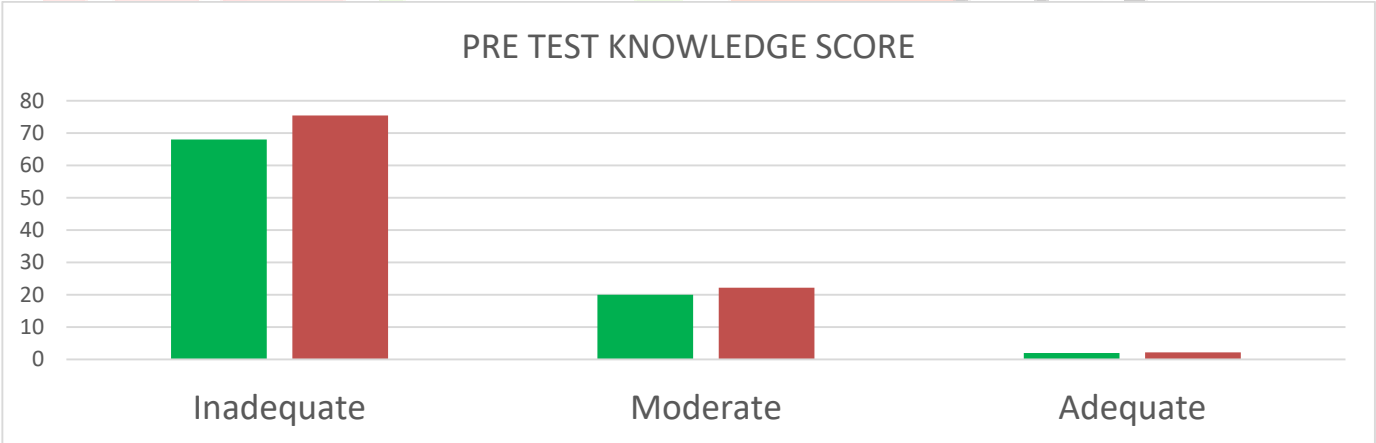


DESCRIPTION OF PRE-TEST KNOWLEDGE LEVEL OF STUDY STUDENTS.

Level of knowledge	No. of students	%
Inadequate	68	75.5%
Moderate	20	22.2%
Adequate	2	2.2%
Total	90	100%

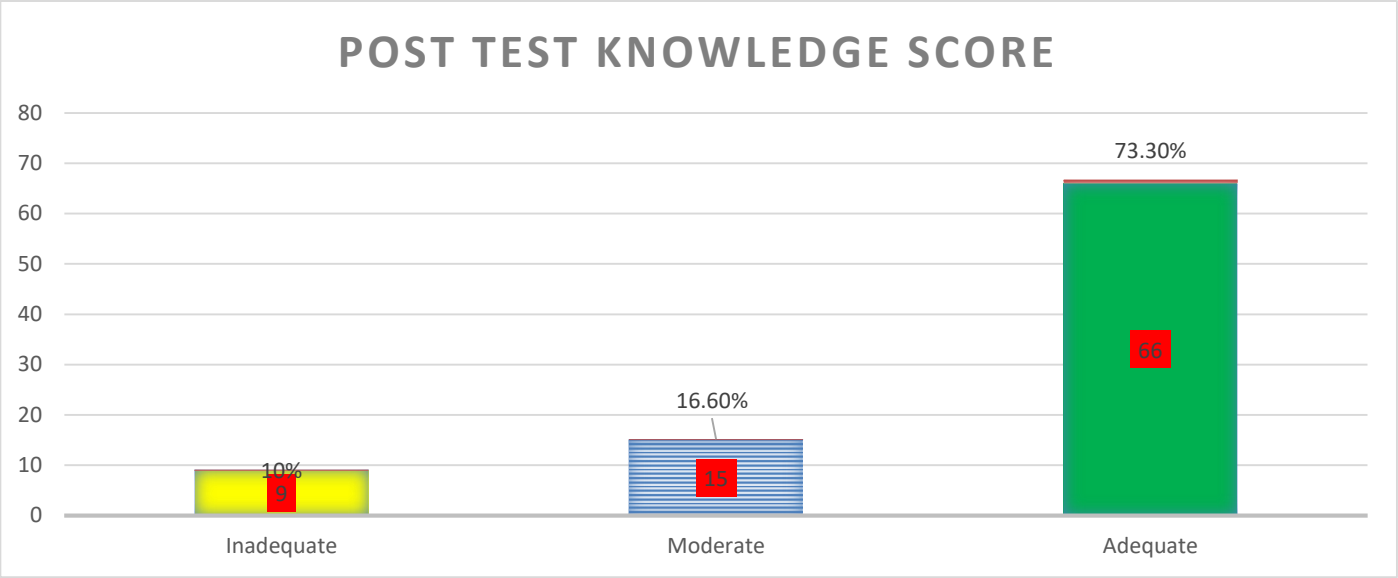
the pre-test knowledge level of study Students in which 75.5% of students are having inadequate level of knowledge score, 22.2% of them having moderate level of knowledge score, and 2.2% of them are having adequate level of knowledge score.



DESCRIPTION OF POST-TEST KNOWLEDGE LEVEL OF STUDY STUDENTS.

Level of knowledge	No. of students	%
Inadequate	9	10%
Moderate	15	16.6%
Adequate	66	73.3%
Total	90	100%

the post-test knowledge level of study Students in which 10% of the students are having inadequate level of knowledge score, 16.6% of them having moderate level of knowledge score and 73.3% of them are having adequate level of knowledge score.

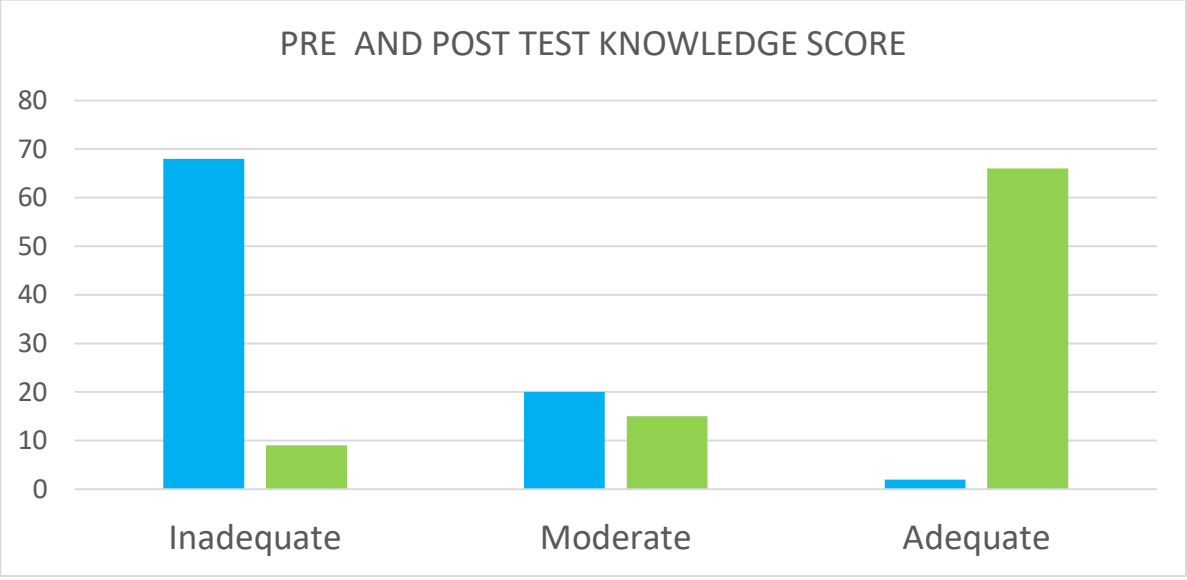


COMPARISON OF PRE-TEST AND POST-TEST KNOWLEDGE LEVEL OF STUDY STUDENTS.

Level of knowledge	PRE-TEST	%	POST TEST	%
Inadequate	68	75.5%	9	10%
Moderate	20	22.2%	15	16.6%
Adequate	2	2.2%	66	73.3%
Total	90	100%	90	100%

The table describes that the pre-test knowledge level of study Students in which 75.5% of students are having inadequate level of knowledge score, 22.2% of them having moderate level of knowledge score, and 2.2% of them are having adequate level of knowledge score.

In post-test knowledge level of study Students in which 10% of the students are having inadequate level of knowledge score, 16.6% of them having moderate level of knowledge score and 75.5% of them are having adequate level of knowledge score.



EFFECTIVENESS OF STRUCTURED TEACHING PROGRAMME AND GENERALIZATION OF KNOWLEDGE GAIN SCORE

S.NO	KNOWLEDGE	MEAN	MEAN DEFFRENCE	MEDIAN	SD	T TEST
1.	PRE-TEST	**10.2**	6	11	2.51	2.91
2.	POST TEST	**16.2**		17	3.3	

The table describes the effectiveness of structured teaching program on knowledge regarding prevention of computer vision syndrome among 4th year BSc nursing students at selected in Asram nursing college at Eluru. On an average, in post-test after having structured teaching programme, Students are gained 6(5.1%) more knowledge score than pretest score. This gain shows the effectiveness of the study. Differences and generalization of knowledge gain score between pre-test and post-test score was calculated using and mean difference with 95% CI and proportion with 95

ASSOCIATION BETWEEN THE POST-TEST LEVEL OF KNOWLEDGE SCORE WITH DEMOGRAPHIC VARIABLES.

NO=90

S.NO	DEMOGRAPHIC VARIABLES	ADQUATE KNOWLEDGE	MODARATE ADQUATE KNOWLEDGE	IN ADQUATE KNOWLEDGE	CHI - SQUARE VALUE	DF	SIGN-P VALUE
1.	AGE IN YEARS 1. 21 YEARS 2. 22YEARS 3. 23 YEARS 4. 24 YEARS	39 30 5 0	3 5 2 0	2 3 1 0	3.70	4	NS
2.	TYPE OF FAMILY 1. NUCLEAR FAMILY 2. JOINT FAMILY 3. OTHERS	56 14 3	4 3 2	3 2 3	14.3	4	S
3.	OCCUPATION OF THE FATHER	26 26	7 3	2	7.72	6	NS

	1. UNEMPLOYEE 2. PRIVATE EMPLOYEE 3. FARMER 4. GOVT EMPLOYEE	18 6	3 0	1 1 2			
4.	OCCUPATION OF THE MOTHER 1. UNEMPLOYEE 2. PRIVATE EMPLOYEE 3. FARMER 4. GOVT EMPLOYEE	37 37 0 1	8 2 1 1	1 0 1 1	31.3	6	S
5.	MONTHLY INCOME OF FAMILY 1. 6000 TO 10000 2. 11000 TO 15000 3. 16000 TO 20000 4. ABOVE 40000	14 22 19 19	4 5 2 1	2 1 0 1	5.6	6	NS
6.	HOBBY 1. OUT DOOR GAMES 2. INDOOR GAMES 3. INTERNET CHATTING	20 16 10 28	3 2 1 2	2 2 2 2	1.66	6	NS

	4. MOVIES						
7.	DURATION OF COMPUTER USE 1. LESS THAN 3 HOURS 2. 3 TO 6 HOURS 3. MORE THAN 6 HOURS	46 30 2	2 4 3	2 0 1	18.4	4	S
8.	REASON FOR COMPUTER USE 1. EDUCATION 2. GAMES 3. MOVIES 4. OTHERS	464 225	432 0	111 1	12.2	6	NS

Note: NS-Not Significant, at $p<0.05$ level.

This table presents the association between various **demographic variables** and the **knowledge levels** (categorized as Adequate Knowledge, Moderately Adequate Knowledge, and Inadequate Knowledge). The **Chi-square test** was applied to determine whether there was a statistically significant association between each demographic variable and the knowledge level.

1. Age in Years:

- Students aged 21 and 22 years showed the highest levels of adequate knowledge.
- The Chi-square value is **3.70** with **4 degrees of freedom (df)**.
- The result is **not significant (NS)**, indicating **no significant association** between age and knowledge level.

2. Type of Family:

- Students from **nuclear families** had higher levels of adequate knowledge.
- The Chi-square value is **14.3** with **4 df**.
- The result is **significant (S)**, suggesting a **significant association** between type of family and knowledge level.

3. Occupation of the Father:

- Majority of Students whose fathers were unemployed or private employees had adequate knowledge.
- The Chi-square value is **7.72** with **6 df**.
- The result is **not significant (NS)**, indicating **no association** between father's occupation and knowledge level.

4. Occupation of the Mother:

- Students whose mothers were unemployed or private employees showed more adequate knowledge.
- The Chi-square value is **31.3** with **6 df**.

- The result is **significant (S)**, indicating a **strong association** between mother's occupation and knowledge level.

5. Monthly Family Income:

- Students from families with income ranging between ₹11,000 to ₹20,000 had higher adequate knowledge.
- The Chi-square value is **5.6** with **6 df**.
- The result is **not significant (NS)**, showing **no significant association** between monthly income and knowledge level.

6. Hobby:

- Watching movies and playing outdoor games were common hobbies.
- The Chi-square value is **1.66** with **6 df**.
- The result is **not significant (NS)**, showing **no association** between hobby and knowledge level.

7. Duration of Computer Use:

- Students using computers for less than 3 hours daily had higher knowledge scores.
- The Chi-square value is **18.4** with **4 df**.
- The result is **significant (S)**, indicating a **significant association** between computer use duration and knowledge level.

8. Reason for Computer Use:

- Education was the most common reason for computer use among Students with adequate knowledge.
- The Chi-square value is **12.2** with **6 df**.
- The result is **not significant (NS)**, indicating **no significant association** between reason for computer use and knowledge level.

SUMMARY:

The study aimed to assess the effectiveness of a structured teaching program on improving knowledge levels among Students. The findings clearly demonstrate a significant improvement in knowledge from the pre-test to the post-test.

- In the **pre-test**, the majority (75.5%) of Students had **inadequate knowledge**, while only 2.2% had **adequate knowledge**.
- After the intervention, in the **post-test**, **adequate knowledge** rose sharply to **73.3%**, with only 10% remaining in the inadequate category.
- The **mean knowledge score** increased from **10.2 in the pre-test** to **16.2 in the post-test**, showing a **mean difference of 6 points**.
- The **t-test value** of **2.91** confirms that the increase in knowledge was statistically significant.

Regarding the **association between demographic variables and post-test knowledge**:

- A **significant association** was found with the following variables:
  - **Type of family** – Students from nuclear families had higher levels of knowledge.
  - **Mother's occupation** – Children of unemployed or privately employed mothers showed better knowledge outcomes.
  - **Duration of computer use** – Students who used computers for shorter durations (<3 hours) had better knowledge.
- Other variables such as age**,** father's occupation**,** monthly family income**,** hobby**, and** reason for computer use **did** not show a statistically significant association with knowledge levels.

CONCLUSION:

The findings of this study strongly indicate that the structured teaching program was highly effective in enhancing the knowledge levels of the Students. The substantial shift from inadequate to adequate knowledge post-intervention, along with the statistically significant mean score improvement, underscores the value of targeted educational interventions.

Additionally, demographic factors such as family type, mother's occupation, and screen time patterns influenced knowledge acquisition, suggesting that individual and environmental contexts play a role in learning outcomes.

Hence, future educational programs should consider these contextual factors to maximize effectiveness and ensure personalized learning strategies for diverse student populations.

Recommendations for Further Research

1. This study can be replicated with Large Sample Studies Conduct with 500+ participants across multiple institutions for better statistical power and generalizability.

2. This study can be extended to IT Department Staff Target IT employees who spend 8-10 hours daily on computers and have highest CVS risk.
3. This study can be implemented among Corporate Workforce Implement in software companies, call centers, and data entry organizations with prolonged screen exposure.
4. This study can be adapted for Educational Institution Staff Extend to faculty, administrative staff, and librarians who use computers extensively for work.
5. This study can be conducted among Healthcare Workers Study radiologists, medical coders, and hospital staff working regularly with computer systems.
6. This study can be modified for Multi-age Groups Adapt for different ages from school children to elderly using computers and smartphones.
7. This study can be applied to Online Learning Students Target distance learning and online course students with extended digital device usage.
8. This study can be utilized for Gaming Community Modify for professional gamers, e-sports players, and heavy computer game users.

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CONFLICT OF INTEREST

The author declares no conflict of interest in relation to this study.

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