Effectiveness Of Structured Teaching Programme On Knowledge And Skills Of Teachers Regarding Identification Of Visual Problems Among School Children In Selected Schools, Manipur

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Abstract:
A vision disorder is an impairment of the sense of vision. Vision disorder is not the same as an eye disease. Although many vision disorders do have their immediate cause in the eye, there are many other causes that may occur at other locations in the optic pathway.
Aim of the study: To determine the effectiveness of structured teaching programme on knowledge and skills of teachers regarding identification of visual problems among school children and to correlate the knowledge and skills of teachers regarding identification of visual problems among school children. Design: Pre-experimental one group Pre-test post-test design was utilized in this study. Study Sample: The Non-probability, convenience sampling technique among 100 teachers. Setting: The study will be in selected at highschool, Manipur. Tool of data collection: A structured knowledge questionnaire. Results: It is inferred that there is a significant increase in the level of skills of teachers on identification of visual problems after the structured teaching programme at the level of P < 0.05. This reveals that out of 100 samples, majority of them 54 (54%) had Moderate skill, 39 (39%) had Adequate skill and only 7 (7%) had Inadequate skill.
Keywords: *Vision, Disorder, Visual problems, Non-probability, convenience*

I.   Introduction:

Vision plays an important role in a child's overall health and academic performance . However, eyesight of children is overlooked by many parents. It is highly recommended that a child should have a comprehensive visual examination at three old, even if there are no obvious visual signs that have been detected or realized.[1]

A vision disorder is an impairment of the sense of vision. Vision disorder is not the same as an eye disease. Although many vision disorders do have their immediate cause in the eye, there are many other causes that may occur at other locations in the optic pathway.

Health is a fundamental part of early child development and of overall health and wellbeing. Early childhood is a sensitive period for the development of the visual system, and ocular disorders are one of the most common disabilities in children. Vision conditions in early childhood can lead to vision loss, visual impairment, or blindness, and may impact an individual's health, educational achievements, employment options and social functioning across the lifespan.

Only eye professionals can make a determination that whether a child is seeing properly, which is necessary to get good academic performance. Good vision is essential in learning, especially for those children in their early school year. Much basic knowledge is earned through visual perception in children. In the learning process, children still gradually gain visual skills, which are necessary to learn effectively.

Visual defect in school – aged children exert negative impact on them. In some cases, children with poor vision have to struggle to read their books or to see the chalkboard at their seats,which could impose undue stress on their visual system. In consequence, those children may lose interest in certain subject and get lower scores. What'smore serious, some children may develop a lack of self-esteem and even become behavioural students in school .Studies have found that attention deficit and hyperactivity in children are mostly caused by vision problems.

There are further visual deficiencies in children who have 20/20 sight. These deficiencies can also affect school performance. They include having problems shifting the eyes from reading to a distance position, losing place while reading, rereading the same line over and over, frequent reversals in numbers or letters and

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taking 2 hours to complete 20 minutes of homework and so on .In 1862 Herman Snellen, a Dutch ophthalmologist, developed the Snellen chart which measures visual acuity for distance. In the U.S. that distance is 20 feet. Even though the Snellen chart is the oldest diagnostic test for vision that is still used, it is also the most popular way to check a child's vision.[2]

People who have poor vision or cannot see are said to be visually challenged. Visually challenged people can read or write through a special system called BRAILLE SYSTEM. It was developed by Louis Braille in 1821.

WHO's work is directed by the recommendations of the WHO World Report on Vision (2019) and the resolution on "integrated, people-centered eye care, including preventable blindness and vision impairment," which was passed at the 73rd World Health Assembly in 2020. The main idea of the report and resolution is to make integrated people-centered eye care (IPEC) the best way to care for people's eyes and to make sure it is widely used.[3]

A good education for the child means good schools, good teachers and good vision. The eyes of children are always being used in school and at play. So, if a person can't see well, it will hinder his or her ability to learn and take part in pleasurable activities. If any of these talents or others are missing or not working right, the youngster will have to work harder. This can give you headaches, make you tired, and cause other problems with your eyes. Teachers and parents should be on the lookout for signs that a kid has trouble seeing or processing what they see.[4]

According to Vision Facts and Statistics published by the Vision Council of America, studies show 48% of parents have not taken their children, ages 12 and younger, to an eyedoctor. One in 4 children has visionproblems that go undetected. Experience in the classroom teaches that vision problems can develop in children at any age, so it is important for teachers to be watchful of symptoms that can easily be detected during a normal day in the classroom. Both safety and learning are heavily dependent upon a child's eye health. Unfortunately, most vision tests in school test for far vision (reading an eye chart), but rarely test for near vision. If the teacher suspects a problem, notification should be sent to the parents to take the child for a professional eye examination. Parents unable to afford the service, the nurse should seek help through organizations that might be able to help.[5]

According to Carmen Willings(2019)The mission of Teaching Students with Visual Impairments is to give all people involved in teaching blind or visually impaired students the tools they need to help each student become a successful member of his or her community. It is also to give people in the field of visual impairments the tools they need to meet the wide range of needs of the students they teach.[6]

According to Kulkarni (2022), the leading causes of SVI and blindness among pupils in special schools in this study in Maharashtra are entire globe anomalies, and roughly a third of the causes are avoidable. Blindness from ROP may be rising, indicating a need to expand screening coverage. There is a need to develop and strengthen accessible rehabilitation programmes to assist impacted youngsters in leading rewarding and independent lives in the future.

Overall, several approaches to reducing the burden of juvenile blindness include health education and promotion, early screening to detect treatable causes of blindness, low vision devices to improve functional vision, and early intervention programmes to rehabilitate permanently blind children. To accomplish this, eye care must be integrated into general child healthcare programmes.[7]

Berthold Lowenfeld (1973) said, "Education must aim at giving the blind child knowledge of the realities around him, the confidence to cope with these realities, and the feeling that he is recognized and accepted as an individual in his own right." Today the tendency of keeping the visually impaired students separate from the sighted ones has been changed.Where all the students may get an equal environment for learning.[8]

A document titled "the right to education for person with disabilities" published by UNESCO (2015) hold that no one must be denied access to education because of disability.[8]

With the above findings it is observed that vision screening in children is important for early detection of visual impairment, identification of possible causes and management at an early stage.

II. Methods And Materials:

A Pre-experimental one group Pre-test post-test study was conducted among 100 teachers. The Non-probability, convenience sampling technique was used to select samples. **Inclusion criteria for sample collection are** Are in the selected English medium schools at Manipur. Are willing to participate in the study. Are male and female teachers. Are teaching from I to VII class. **Exclusion criteria** for the sample collection are the study excludes teachers who, Are not available at the time of data collection**.** Are not teaching ICSE syllabus. Before commencing the data collection, authorized setting permission was obtained from institutional review board/ ethical committee and principal of selected high school, Manipur. 100 samples were selected in schools

Needs of the Study:

Children are one third of our population and all of our future. In order to develop a healthy society, it is important that we have healthy children. Primary school age is a dynamic period of physical growth and development. Children develop as they interact with their surroundings.

According to WHO statistics, every minute a child somewhere in the world goes blind (World Health Organization, 2009). More than 12 million children ages 5 to 15 are visually impaired due to uncorrected refractive errors as a result of near-sightedness, far-sightedness, or astigmatism (World Health Organization, 2009). Over 285 million people in the world are visually impaired, of whom 39 million are blind and 246 million have moderate to severe visual impairment (WHO, 2011) Approximately 90% of visually impaired people live in developing countries. An estimated 19 million children below 15 years are visually impaired.[9]

Globally, The World Health Organization estimates that 1.4 million children worldwide are blind, 17.5 million suffer from moderate to severe visual impairment and 18.9 million have general visual impairment.

In an American study Based on data from the 2004 National Health Interview Survey, approximately 19 million persons (8.8%) age 18 and over report having any trouble seeing, even when wearing glasses or contact lenses (Lethbridge-Cejku,Rose,&Vickerie,2006).Based on data from the Survey of Income and Program Participation (Steinmetz, 2006), 189,000 children age 6-14 years of age (0.5%) have difficulty seeing words and letters in ordinary newsprint even when wearing glasses or contact lenses. Of those, 42,000 have a severe vision impairment (unable to see words and letters ordinary newsprint), and 147,000 have a non- severe vision impairment (Steinmetz, 2006).[9]

In India, the prevalence of totally blind persons found to be 156 per lakh population and the prevalence of low vision found to be 61 per lakh population. Among the major states of India, the prevalence of blindness found to be highest in Orissa (226 per lakh population) followed by Uttar Pradesh (204 per lakh population) and Andhra Pradesh (190 per lakh population) where as it is least in Assam (88 per lakh population) followed by Jharkhand and Gujarat (98 and 99 per lakh population respectively). The prevalence of low vision is also found to be highest in Orissa (188 per lakh population) followed by Andhra Pradesh (96 per lakh population). Jharkhand (18 per lakh population), Haryana (24 per lakh population) and Gujarat (27 per lakh population) are some states which shows the lowest prevalence of low vision in the country. The analysis of prevalence of visual disability by background characteristics found that the prevalence of both blindness and low vision is highest in rural areas compared to urban areas. The sex-wise differential shows that both blindness and low vision found to more prevalent among females than males.[10]

Visual problem is defined as the ability of the eye to take in information and interpret it. It is not just seeing but translating visual images into information that the brain can remember, organize, recognize and use. It allows children to understand what an image means, such as shape and letter recognition. Optometrists Michele Bessler and Martin Birnbaum say that one in four children have vision impairments, such as problems with visual perception, that can make it hard for them to do well in school.[11]

At least 2.2 billion individuals throughout the world have trouble seeing things up close or far away. At least 1 billion of these cases, or approximately half, could have been averted or are still being taken care of. Uncorrected refractive defects and cataracts are the main reasons why people can't see well or go blind.**[12]**

Ariffin S,etl (2024) A descriptive study was done on Teachers' Knowledge, Attitude, and Practice on Schoolchildren's Visual and Eye Health and aims to understand the level of KAP among teachers on this matter and the methodology used to conduct these studies. This scoping review was conducted using Arksey and O'Malley's framework for scoping studies. A systematic search using electronic databases (Scopus, Web of Science, PubMed and Ebscohost) was conducted to identify relevant articles, imported into the Rayyan web application for review management. A total of 463 articles were identified during the selection process, and 17 articles were eventually included in this scoping review after eligibility screening. These studies were grouped into three designs: crosssectional, intervention, and qualitative. This scoping review revealed that the level of knowledge and practice among teachers on schoolchildren's visual and eye health was low to moderate, while the level of attitude was good. Some misconceptions exist among teachers regarding children's visual and eye health. Training programmes for teachers are crucial to significantly improve their KAP levels. Most of the teachers lacked the knowledge and practice concerning children's visual and eye health. However, with a good attitude, their awareness level can be upgraded with proper training, eye screening facilities, and access to information.[13]

Parya Abdolalizadeh, (2021)Global burden of children with vision problems: a trend analysis from 1990 to 2017 was the title of a study. In 2015, 252 million individuals throughout the world had trouble seeing. Of those, 216 million had low vision (visual acuity of 3/60 or less in the better eye) and 16 million were blind (visual acuity of 3/60 or less in the better eye). It has been predicted that by 2020, 275 million more people around the world will have trouble seeing. From 1990 to 2017, the Global Burden of Disease (GBD) survey found that, in terms of disability-adjusted life years (DALY), eye impairment was the third most common

disability in the world, after anaemia and hearing loss. Blindness and vision problems in children are serious public health issues all over the world. In 2000, the WHO said there were about 1.4 million blind children under the age of 18 in the world. In 2010, the world estimated that 19 million youngsters younger than 14 years old have trouble seeing.[14]

Muma S, Obonyo S. (2020) conducted a cross-sectional population-based study on the prevalence and causes of visual impairment among children in Kenya. Sample consists of 3400 (1800, 52.9% female) randomly selected children with a mean age of 12 ± 2 years (range 5-16 years). Visual acuity was taken using Snellens chart at 6 m. Anterior and posterior segment was assessed using slit lamp and indirect ophthalmoscope.Result shows that the mean prevalence of visual impairment based on pin-hole value was 1.7 ± 0.3% using World Health Organization definition. Multivariate analysis demonstrated that the presence of visual impairment on pin-hole increased significantly with increasing age (odds ratio 1.230, P = .021) and uncorrected refractive error (odds ratio 0.834, P = .032) according to World Health Organization definition. Causes of visual impairment due to presenting visual acuity were nystagmus (14%), amblyopia (24%) and uncorrected refractive error (62%).[15]

Afshan Yasmeen (2016) A descriptive study was done on Keep an eye on children's vision by the State-run Minto Institute of Ophthalmology, 10.5 per cent of children intheagegroup of 10 to 15 studying in 20 government and Bruhat Bangalore MahanagaraPalike schools in Bangalore South have eye problems. Doctors from the hospital screened 2,500 students of these schools during the past one year. Of these, at least 263 students had vision defects, mainly refractive errors and squint. More than 30% of children aged less than 6 in Karnataka suffer from vision impairment such as refractive errors and squint. Teachers should betrained to screenchildren for eye problems so that any defect can be detected by the time they reach the age of six.[16]

Rustagi N, Uppal Y, Taneja D K. (2012) conducted a intervention study on screening for visual impairment: outcome among schoolchildren in a rural area of Delhi. 1123 students studying in five government schools in the field practice area were chosen as the study subjects. Result shows that out of 1123 students enrolled, 1075 (95.7%) students were screened for refractive errors. Low vision (visual acuity < 20/60) in the better eye was observed in 31 (2.9%) children and blindness (visual acuity <20/200) in 10 (0.9%) children. Compliance with referral for refraction was very low as only 51 (41.5%) out of 123 students could be tested for refraction. Out of 48 students, 34 (70.8%) procured spectacles from family resources but its regular use was found among only 10 (29.4%) students.[17]

Bhattacharjee H, (2008) A cross sectional study to determine the causes of severe visual impairment and blindness amongst children from schools for the blind in the four states of North Eastern Regions (NER) of India. A total of 376 students were examined of whom 258 fulfilled the eligibility criteria. The major anatomical causes of visual loss amongst the 258 were congenital anomalies like anophthalmos, microphthalmos 93, corneal conditions –scarring and vitamin A deficiency 94, cataract or aphakia 28, retinal disorders 15 and optic atrophy 14. In the NER states of India, vitamin A deficiency is a major cause of childhood blindness that can be prevented. This is different from other Indian states.[18]

Das A, Dutta H, Bhaduri G(2007) A descriptive study was done to find out how big the problem was. This study was done with school children in Kolkata who were 5 to 10 years old. Both in the schools and at the Regional Institute of Ophthalmology in Kolkata, eye exams were done in great detail. Out of the 2317 kids who were checked, 582 had refractive problems, with myopia being the most common (n = 325). Ninety-one kids had astigmatism. With age, the number of people who have refractive errors goes up, but this is not statistically significant. There is also no big difference between boys and girls when it comes to refractive defects. [19]

Chaturvedi S, (1999) A descriptive research was done to look at the pattern and distribution of eye diseases among elementary school students in rural Delhi. Six hundred and seventy-nine first graders were checked for eye disease. Their ages ranged from 5 to 15, and there were almost as many boys as girls. There were a lot of people with eye disorders. Over 40% of the children who were studied had one or more disorders with their eyes. The most prevalent eye disease was trachoma (18%), followed by a lack of vitamin A (10.6%), poor vision (7.4%), and a visible or latent squint (7.4%). In most of these eye problems, most of the kids that had them were from the less developed districts of Delhi in the east. It looks like youngsters who don't have PEM are just as likely to get eye disorders as those who do.[20]

The investigator has observed that many school children go undetected visual problems by school teachers. Poor vision will hamper the child's ability and education. Hence, it is the responsibility of the teacher of students with visual impairments to carry out the following specialized activities such as participating in the

multidisciplinary assessment of infants, children, and youth with visual impairments, assuming the primary responsibility to conduct and interpret functional vision assessments and obtaining and interpreting all ophthalmological, optometric, and functional vision reports and the implications there for educational and home environments, to families, classroom teachers, and other team members and assisting families to assess their own strengths and needs regarding their children's visual, academic, and functional development. Thus, the problem for the research was formulated.

Description of the tool
The tools consists of 3 sections covering the following areas.
Section A: A structured knowledge questionnaire for collecting demographic data of the teachers such as age, educational status, working experience, subject taught, class taught and previous information regarding visual problems.
Section B: Structured knowledge questionnaire on knowledge of teachers regarding Identification of Visual Problems

A structured knowledge questionnaire used to assess the knowledge of teachers regarding Identification of Visual Problems such as general information about visual problem, refractive error, short sightedness, far sightedness and crossed eye.
Section C: Astructured knowledge questionnaire to assess the skills of teachers regarding identification of visual problem.

Score interpretation
The knowledge and skills regarding Identification of Visual Problems will be measured in terms of knowledge scores. Each correct answer will give a score of one and wrong answers a score of zero. The maximum score will 40. To interpret the levelof knowledge and skill the scores will distribute as follows.
Inadequate <50%
Moderate 50 – 75%
Adequate >75%
An answer score key will prepare for scoring answer to the structured knowledge questionnaire.

Preparation of first draft of teaching package.
The first draft of teaching package will develope on thebasis of information obtained during extensive literature review and objectives in blue print. The entire content will prepare as lesson plan.
The content will be given to 7 experts and modifications will be made in the content according to their suggestions and the content will finalize.

Preparation of final draft of teaching package
Preparation of final draft of teaching package will do after the incorporation of expert's opinion and suggestions. The average time taken to teach the content will be around 45 minutes.

III. Results:
The data analysis contains four major sections. The first section describes the frequencies and percentages analysis which is used to describe socio demographic characters of school teachers. The second section includes the descriptive and inferential analysis which describes knowledge and skills of teachers regarding identification of visual problems among school children and the effectiveness of STP. The third section includes the correlation between knowledge and skills of teachers regarding identification of visual problems among school children. Finally, in this fourth section the Chi-square analysis were run to examine the association of level of knowledge and skills of teachers regarding identification of visual problems among school children.

**The objectives of the study**
1. To assess the existing knowledge and skills of teachers regarding identification of visual problems among school children
2. To evaluate effectiveness of Structured Teaching Programme (STP) on knowledge and skills of teachers regarding identification of visual problems among school children.
3. To correlate the knowledge and skills of teachers regarding identification of visual problems among school children.
4. To associate pretest level of knowledge and skills of teachers with selected with selected demographic variables.

Presentation Of Data And Analysis:
The data are organized and presented in the following four sections.

Section 1	Description of socio demographic characters of school teachers
Section 2	2.1: Assess the level of knowledge and skills of teachers regarding identification of visual problems among school children before and after STP
	2.2: Examining the effectiveness of STP
Section 3	Correlation between knowledge and skill regarding identification of visual problems
Section 4	Association between knowledge and skills of teachers regarding identification of visual problems among school children with selected demographic variables of school teachers.

The following schematic outline will also lend guidance that might help explain the pattern of research and analysis.
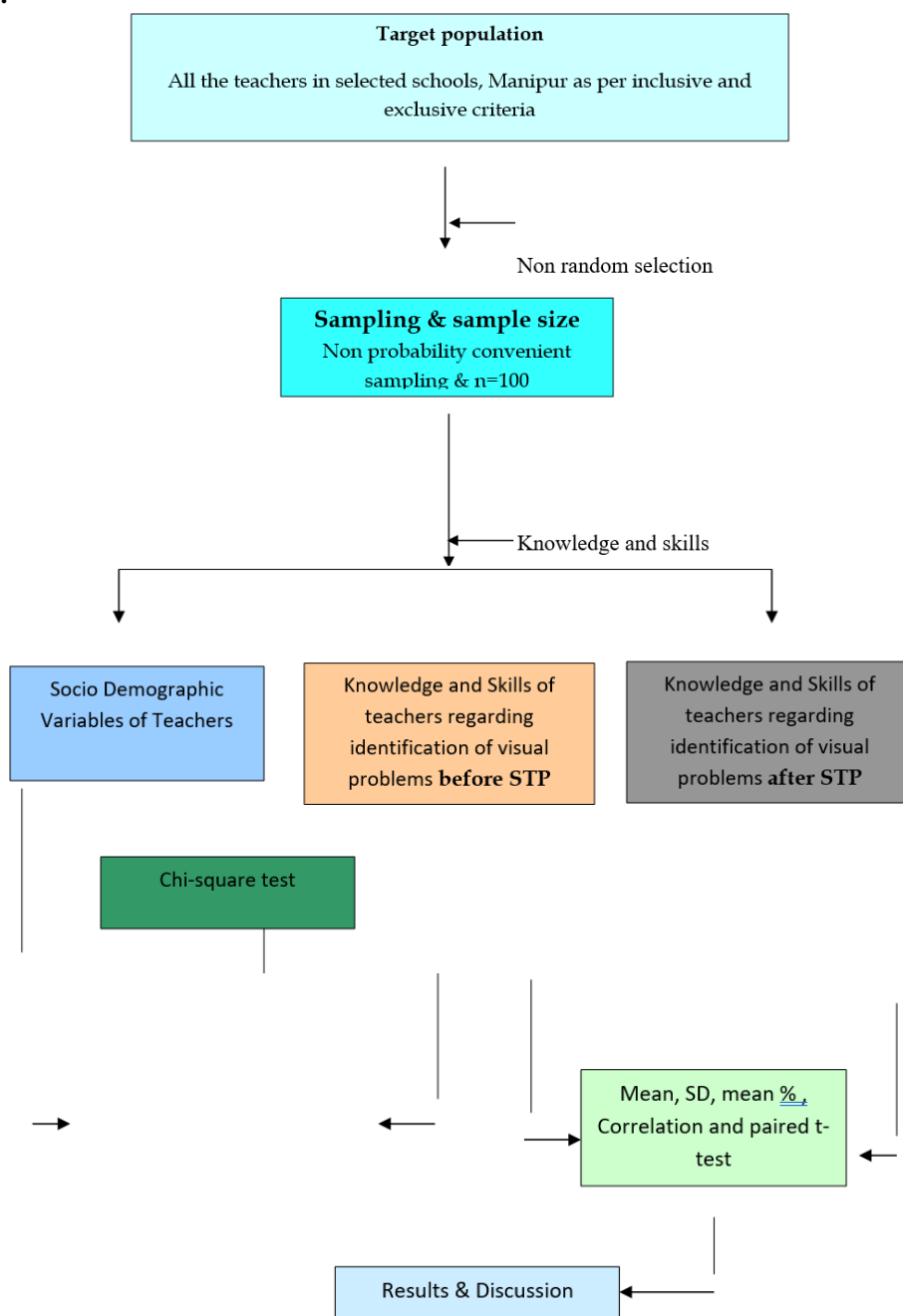
Section - 1: Demographic variables of School teachers

Table–1: Frequency and percentage distribution of teachers according to age, education, working experience, subject taught, class taught and Previous Source of information.

n = 100

Demographic variables		Frequency	Percentage
1. Age group	20-30 yrs	29	29
	31-40 yrs	43	43
	41-50 yrs	21	21
	51-60 yrs	7	7
2. Education	Diploma/TTC	47	47
	B.Ed/ BSc/B.Com	53	53
3. Working experience	1-5 yrs	42	42
	6-10 yrs	37	37
	11-15 yrs	12	12
	16 yrs and above	9	9
4. Subject taught	Science	24	24
	Social	28	28
	Mathematics	19	19
	Others	29	29
5. Class taught	Primary	48	48
	Upper primary	30	30
	Both	22	22
6. Previous Source of information	TV/Radio	34	34
	Friends/Relatives	14	14
	Colleagues/health worker	7	7
	News paper/ Magazines	28	28
	Self experienced	17	17

The data given in table-1 depicts the frequency and percentage distribution of teachers according to age, education, working experience, subject taught, class taught and Previous Source of information. Out of 100 teachers (20-60yrs) with regard to age, majority43 %(43) were in the age of 31-40yrs, 29% 29) in the age 20-30yrs, 21% (21) in the age 41-50, the remaining 7% (7) in the age of 51-60yrs.

With regard to educational status 53% (53) of the subjects were B.Ed/ BSc/B.Com and the remaining were 47% (47) of the subjects were Diploma in education/TTC.

With regard to working experience, 42% (42) were having 1-5yrs experience, 37% (37) were having 6-10yrs experience, 12%(12) were having 11-15yrs experience and the remaining 9%(9)were having 16 and above years of experience.

With regard to subject taught, 29% (29) of them taught other subjects, 28% (28) of them taught social, 24% (24) of them taught science and 19% (19) of them taught Mathematics.

With regard to Class taught majority 48 % (48) of teachers taught primary classes, 30 %(30) of them taught upper primary classes and 22%(22) of them taught both primary and upper primary classes.

With regard to Previous Source of information, 34% (34) of them got information from TV/Radio, 28% (28) of them got information from News paper/ Magazines, 17%(17) of were Self experienced, 14%(14) of them got information from Friends/Relatives and 7%(7) of them got information from Colleagues/health worker.
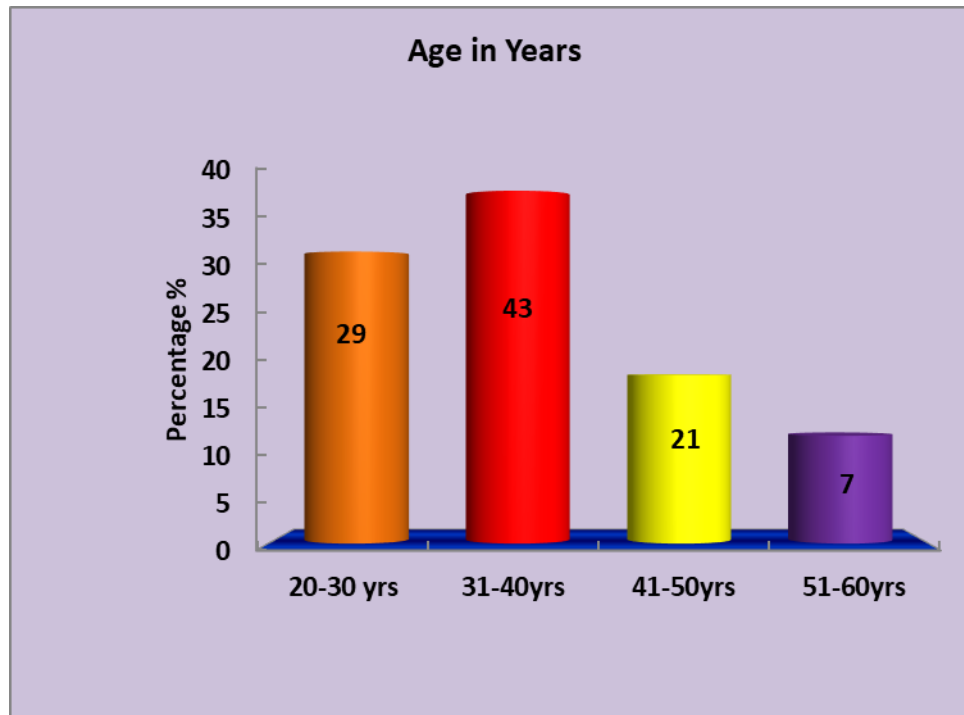
Graph–1: Percentage distribution of teachers according to age.
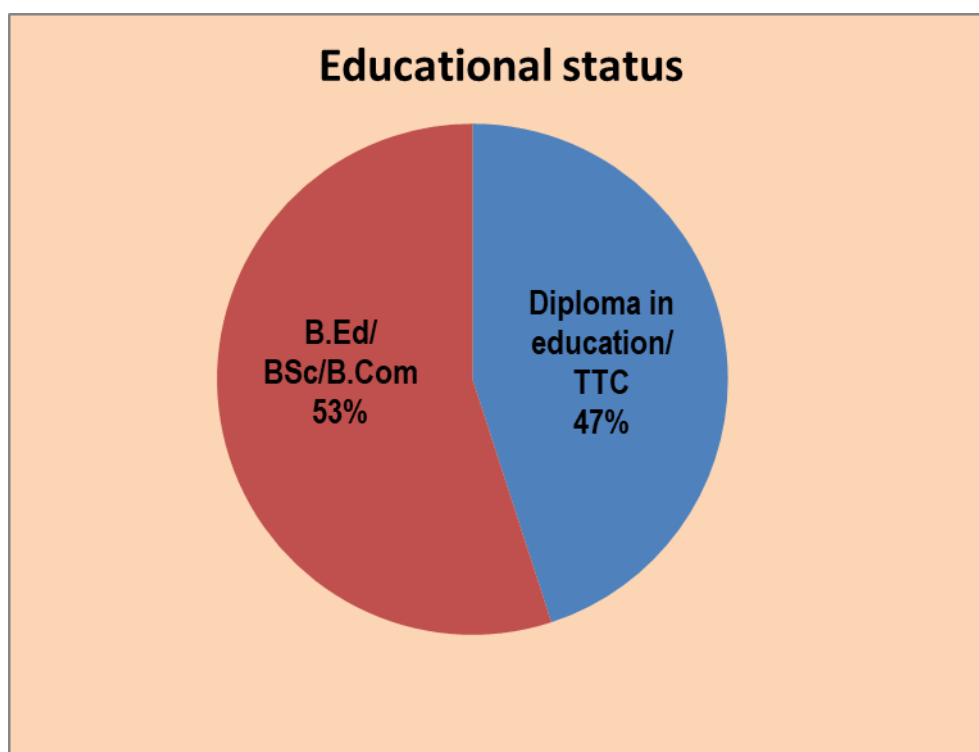
Graph–2: Percentage distribution of teachers according to educational status
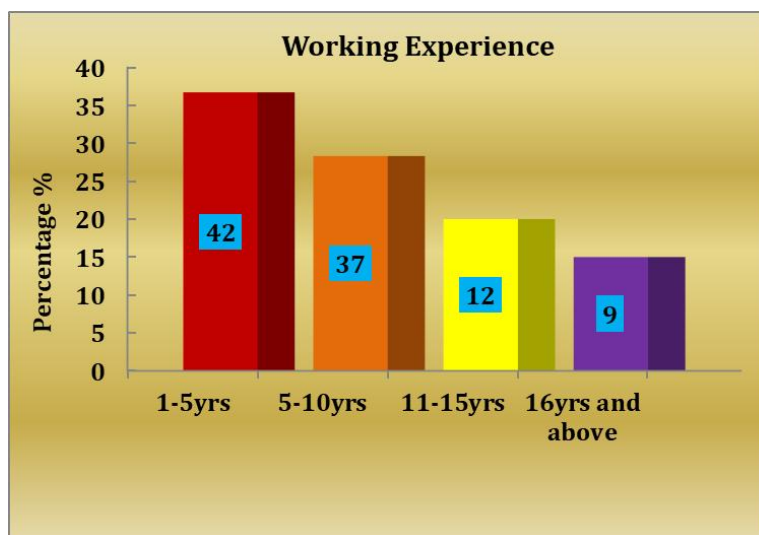
Graph–3: Percentage distribution of teachers according to working experience

Graph–4: Percentage distribution of teachers according to subject taught

Graph–5: Percentage distribution of teachers according to class taught

Graph–6: Percentage distribution of teachers according to Previous Source of information.

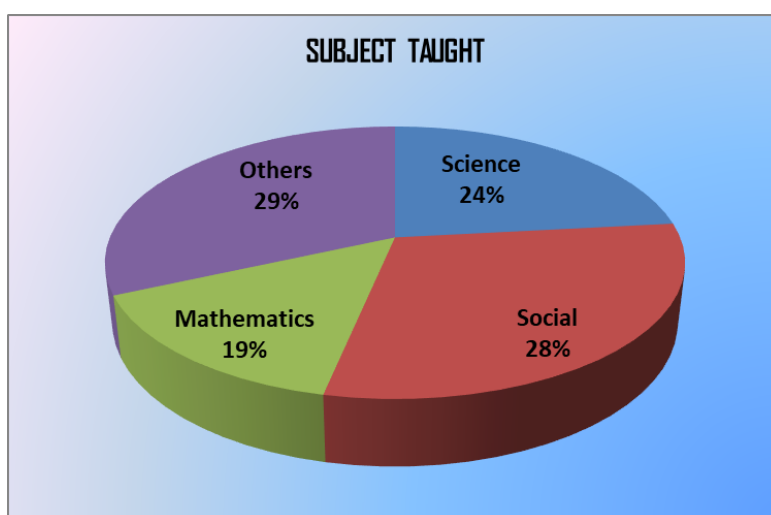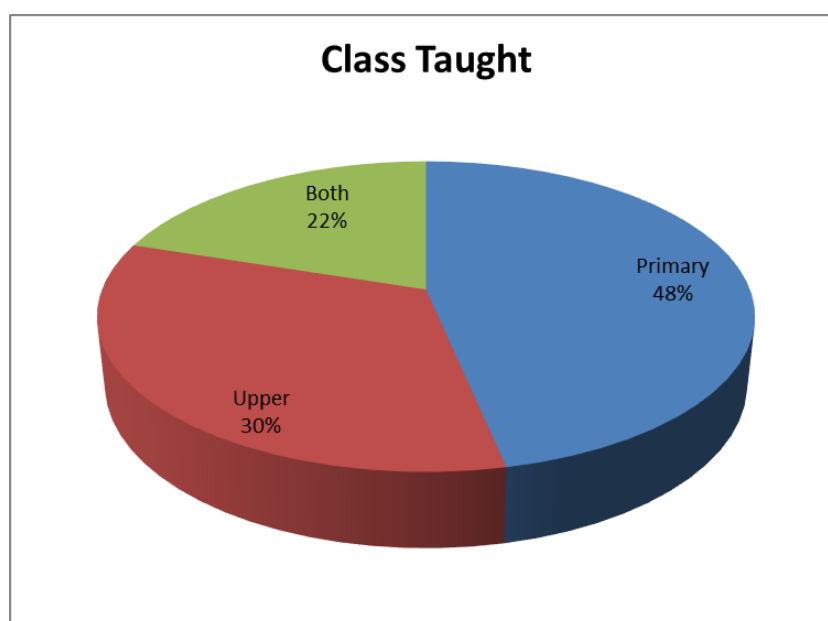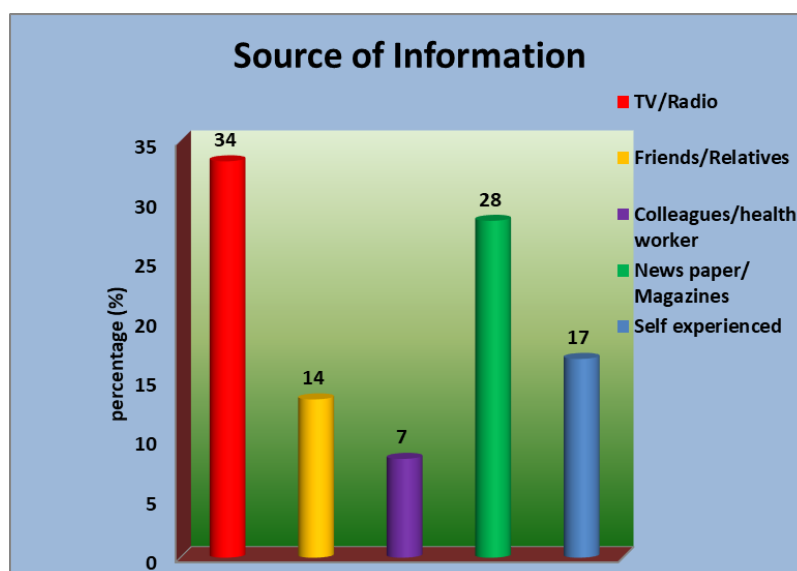**Section –2: Assessment of knowledge before and after STP.**
Table–2.1: Frequency and percentage distribution of teachers on knowledge regarding identification of visual problems before STP.
n=100

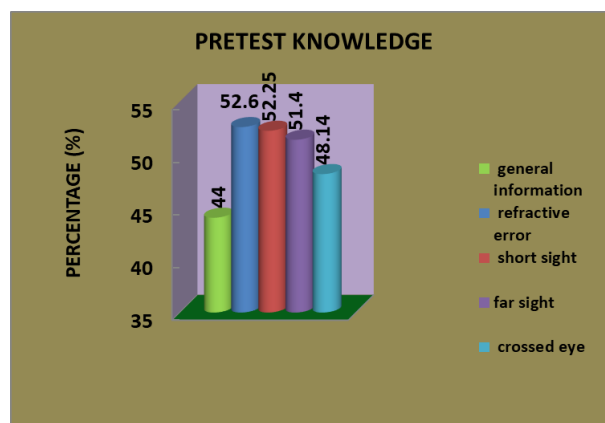| Level of Knowledge	Classification of teachers	
	Pre test	
	Number	Percentage
Inadequate (< 50% of score)	39	39
Moderate (50-75% of score)	41	41
Adequate (> 75 % of score)	20	20
Total	100	100

The above table 2.1 shows frequency and percentage distribution of teachers on knowledge regarding identification of visual problems. Majority of them 39(39%) had Inadequate knowledge, 41 (41%) had Moderate knowledge and only 20(20%) had Adequate knowledge before STP.

Table -2.2: Mean, Standard Deviation & mean percentage of knowledge of teachers   regarding identification of visual problems before STP.
n=100

No.	Aspects of knowledge	Statements	Max. Score	Range Score	Respondents Knowledge		
					Mean	SD	Mean (%)
1	About general information on visual problems	10	10	6-10	4.40	2.87	44
2	About refractive error	6	6	2-6	3.16	1.21	52.6
3.	About short sightedness	4	4	2-4	2.09	0.907	52.25
4	About farsightedness	5	5	1-5	2.57	1.086	51.4
5	About crossed eye	5	5	1-5	2.42	1.401	48.14
6	Over all knowledge	30	30	18-30	16.63	5.3	55.43

The above table 2.2 depicts the assessment over the different aspects of knowledge and overall knowledge before STP through Mean, SD and Mean Score %. The Mean% knowledge regarding general information on visual problems was found to be 44% followed by the Mean% of knowledge about refractive error as 52.6%, about far sightedness as 51.4%, about short sightedness as 52.25% and about crossed eye was 48.14%. The Mean score % of overall knowledge was 55.43% before STP.

Graph 7: Mean, Standard Deviation & mean percentage of knowledge of teachers regarding identification of visual problems before STP.

Table–2.3: Frequency and percentage distribution of teachers on skills regarding identification of visual problems before STP.

n=100

Level of Skills	Classification of Respondents	
	Pre test	
	Number	Percentage
Inadequate (< 50% of score)	71	71
Moderate (50-75% of score)	27	27
Adequate (> 75 % of score)	2	2
Total	100	100

The above table 2.3 shows the frequency and percentage distribution of teachers on skills regarding identification of visual problems. Majority of them 71 (71%) had Inadequate skills, 27 (27%) had Moderate skills and only 2(2%) had Adequate skills.

Table -2.4: Mean, standard deviation & mean percentage of skills of teachers regarding identification of visual problems before STP.

n=100

No.	Skill regarding identification of visual problems	Statements	Max. Score	Range Score	Respondents Knowledge		
					Mean	SD	Mean(%)
1	Skill	10	10	0-10	4.22	1.7	42.2

The above table 2.4 shows the skill regarding identification of visual problems, the Mean was 4.22with SD 1.7 and the Mean(%) was 42.2.

Table–2.5: Frequency and percentage distribution of teachers on knowledge regarding identification of visual problems after STP.

n=100

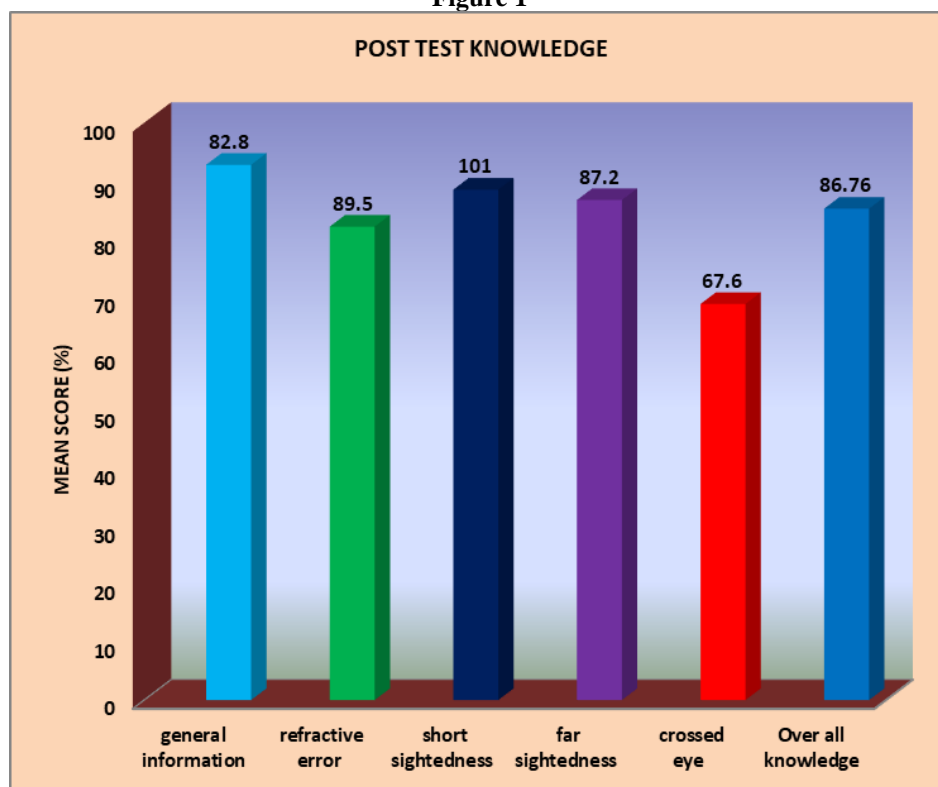| Level of Knowledge	Classification of teachers	
	Post test	
	Number	Percentage
Inadequate (< 50% of score)	1	1
Moderate (50-75% of score)	12	12
Adequate (> 75 % of score)	87	87
Total	100	100

The above table 2.5 shows the frequency and percentage distribution of teachers on knowledge regarding identification of visual problems after STP. Majority of them 87 (87%) had Adequate knowledge, 12(12%) had Moderate knowledge and 1(1%) had Inadequate knowledge.

Table -2.6: Mean, standard deviation & mean percentage of knowledge of teachers regarding identification of visual problems after STP.

n=100

No.	Aspects of knowledge	Statements	Max. Score	Range Score	Respondents Knowledge		
					Mean	SD	Me an(%)
1	About general information on visual problems	10	10	6-10	8.28	1.2006	82.8
2	About refractive error	6	6	2-6	5.37	2.064	89.5
3	About short sightedness	4	4	2-4	4.04	1.017	101
4	About far sightedness	5	5	1-5	4.36	1.296	87.2
5	About crossed eye	5	5	1-5	3.38	1.419	67.6
6	Over all knowledge	30	30	18-30	26.03	3.06	86.76

The above table 2.6 depicts the assessment over the different aspects of knowledge and overall knowledge after STP through Mean, SD and Mean Score %. The Mean% knowledge regarding general information on visual problems was found to be 82.8% followed by the Mean% of knowledge about short sightedness as 101%, about far sightedness as 87.2%, about refractive error as 89.5% and about crossed eye was 67.6%. The Mean score % of overall knowledge was 86.76% after STP.

Figure 1

Graph 8: Mean Score Percentage of knowledge of teachers regarding identification of visual problems after STP.

Table–2.7: Frequency and percentage distribution of teachers on skills regarding identification of visual problems after STP.

n=100

Level of Skills	Classification of Respondents	
	Post test	
	Number	Percentage
Inadequate (< 50% of score)	7	7
Moderate (50-75% of score)	54	54
Adequate (> 75 % of score)	39	39
Total	100	100

The above table 2.7 shows frequency and percentage distribution of teachers on skills regarding identification of visual problems after STP. Majority of them 54 (54%) had Moderate skill, 39 (39%) had Adequate skill and only 7(7%) had Inadequate skill.

Table - 2.8: Mean, standard deviation & mean percentage of skill of teachers regarding identification of visual problems after STP.

No.	Skill regarding identification of visual problems	Statements	Max. Score	Range Score	Respondents Knowledge		
					Mean	SD	Mean(%)
1	Skill	10	10	5-10	7.12	1.16	71.2

The above table 2.8 shows the Skill regarding identification of visual problems after STP, the Mean was 7.12with SD of 1.16 and the Mean(%) was 71.2.

Table–2.9: Frequency and percentage and distribution of teachers on knowledge regarding identification of visual problems before and after STP.

n=100

Knowledge	Respondents Knowledge			
	Pre test		Post test	
	No.	%	No.	%
Inadequate (< 50%)	39	39	1	1
Moderate (50-75%)	41	41	12	12
Adequate (> 75%)	20	20	87	87
Total	100	100	100	100

The above table 2.9 shows in the pretest the majority of them 26 (43.3%) had Inadequate knowledge, 24 (40%) had Moderate knowledge and 10(16.7%) had Adequate knowledge. In the post test majority of them 46 (76.7%) had Adequate knowledge, 14 (23.3%) had Moderate knowledge and no one had Inadequate knowledge.

Table 2.10: Mean & mean score percentage of knowledge of teachers regarding identification of visual problems before and after STP.

n=100

Sno.	Aspect of knowledge	Maximum Possible score	Pretest		Post test		Gain in mean score percentage
			Mean	Mean score%	Mean	Mean score %	
1	About general information on visual problems	10	4.40	44	8.28	82.8	38.8
2	About refractive error	6	3.16	52.6	5.37	89.5	36.9
3	About short sightedness	4	2.09	52.25	4.04	101	48.75
4	About far sightedness	5	2.57	51.4	4.36	87.2	35.8

| 5 | About crossed eye | 5 | 2.42 | 48.14 | 3.38 | 67.6 | 19.46 |
| 6 | Over all knowledge | 30 | 16.63 | 55.43 | 26.03 | 86.76 | 31.33 |

The above table 2.10 represents the comparison of pretest and post test knowledge with gain in Mean Score % on different aspects of knowledge. The Mean knowledge regarding general information on visual problems was 4.40 with Mean score % 44 before STP and found to be increased to 8.28 with Mean score % 82.8%. The enhancement in knowledge on visual problems was observed as 38.8%.

Similarly in all the remaining aspects of knowledge, there was comparative increase on knowledge before and after STP. The gain in Mean score % in the knowledge regarding short sightedness was 52.25%, far sightedness was 51.4%, crossed eye was 48.14% and refractive error was 52.6%.

The Mean knowledge of overall aspects was 16.63 with Mean score % 55.43% and increased to Mean 26.03 with Mean score % of 86.76 before and after STP. The gradation on knowledge was accounted through enhancement and it was found to be 31.33%

Graph 9: Mean & mean score percentage of knowledge of teachers regarding identification of visual problems before and after STP.
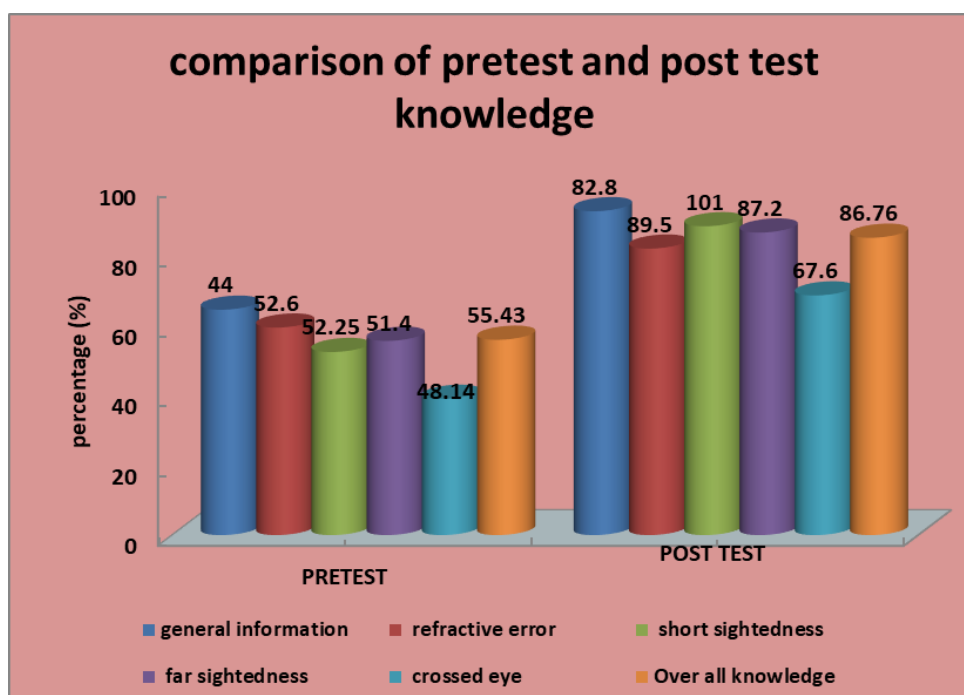
Table–2.11: Frequency and percentage and distribution of teachers on skills regarding identification of visual problems before and **after STP.**
n=100

Level of Skills	Respondents Skill			
	Pre test		Post test	
	No.	%	No.	%
Inadequate (< 50%)	71	71	7	7
Moderate (50-75%)	27	27	54	54
Adequate (> 75%)	2	2	39	39
Total	100	100	100	100

The above table 2.11 depicts the Percentage and frequency distribution of teachers on skills regarding identification of visual problems before and after STP. Before STP majority of them 71 (71%) had Inadequate skill, 27 (27%) had Moderate skill and only 2(2%) had Adequate skill. After STP majority of them 54 (54%) had Moderate skill, 39 (39%) had Adequate skill and only 7 (7%) had Inadequate skill.

Table 2.12: Mean, & mean score percentage of skill of teachers regarding identification of visual problems before and after STP.

n=100

Sno.	Skill regarding identification of visual problems	Maximum Possible score	Pretest		Post test		Gain in mean score percentage
			Mean	Mean score%	Mean	Mean score %	
1	Skill	10	4.22	42.2	7.12	71.2	113.4

The above table 2.11 depicts the Mean, & mean score percentage of skill of teachers regarding identification of visual problems before and after STP. Before STP the Mean was 4.22 and the Mean(%) was 42.2. After STP the Mean was 7.12 and the Mean (%) was 71.2, and Gain in mean score percentage was 113.4.
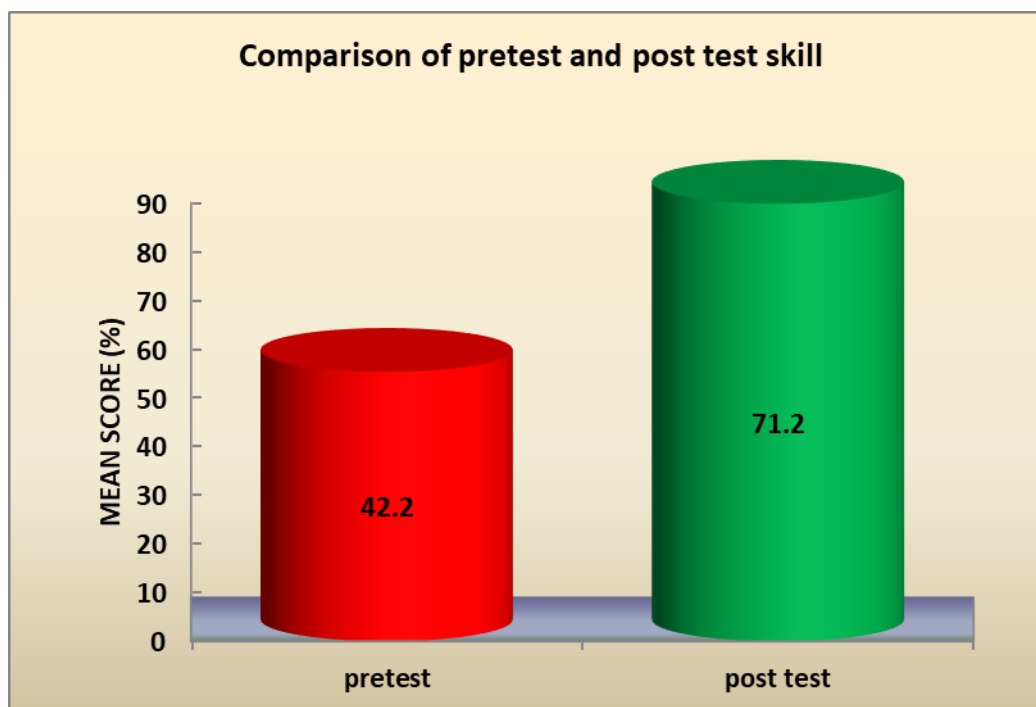
Graph 10: Mean, & mean score percentage of skills of teachers regarding identification of visual problems before and after STP.

Section – 2.2: Examining the effectiveness of STP

Table 2.2.1: Mean and SD of knowledge scores before and after STP and statistical significance.

n=100

S.No.	Aspects of knowledge	Pretest		Post test		paired 't' value	P- Value
		Mean	SD	Mean	SD		
1	About general information on visual problems	4.40	2.87	8.28	1.2006	12.556*	P<0.001
2	About refractive error	3.16	1.21	5.37	2.064	9.364*	P<0.001
3	About short sightedness	2.09	0.905	4.04	1.017	16.492*	P<0.001
4	About farsightedness	2.57	1.0863	4.36	1.296	10.91*	P<0.001
5	About crossed eye	2.42	1.401	3.38	1.419	4.873*	P<0.001
6	Over all knowledge	16.63	5.3	26.03	3.06	15.46*	P<0.001

Note: *- Significant at 5% level for 99 df (i.e. P<0.05)

The above table 2.2.1 presents the outcome of paired 't' analysis based on comparison of means of knowledge before and after STP. The Mean knowledge of overall aspects was 16.77 with SD of 5.52 before STP and increased to Mean of 25.55 with SD 3.32 after STP, the paired 't' was carried out to compare the pre and post test Mean Score and found to be significant at P < 0.001 (i.e, highly significant)

It was also seen for the different aspects on knowledge such as knowledge regarding general information on visual problems, refractive error, short sightedness, farsightedness and crossed eye. In all these aspects on knowledge the Post test Mean score were comparatively more than pretest Mean score and also the paired 't' test was invariably significant at $P < 0.001$ (i.e, highly significant)

Hence, it is inferred that there is a significant increase in the level of knowledge of teachers on identification of visual problems after the structured teaching programme.

Table 2.2.2: Mean and SD of skill scores before and after STP and statistical significance.
n=100

S.No.	Skill regarding identification of visual problems	Pretest		Post test		paired 't' value	P- Value
		Mean	SD	Mean	SD		
1	About general information on visual problems	4.22	1.7	7.12	1.16	14.28	P<0.001

Note: *- Significant at 5% level for 59 df (i.e. P<0.05)

The above table 2.2.2 presents the outcome of paired 't' analysis based on comparison of Means of skill before and after STP. The aspect of skill regarding general information on visual problems the post test Means 7.12 with SD of 1.16 was higher than the pretest Mean 4.22 with SD of 1.7, the paired 't' was carried out to compare the pre and post test Mean Score and found to be 14.28 which was significant at $P < 0.001$ (i.e, highly significant)

Hence, it is inferred that there is a significant increase in the level of skills of teachers on identification of visual problems after the structured teaching programme.

Hypothesis Testing
Research Hypothesis-1
H_1: There is a significant difference between pre and post test knowledge and skill of teachers regarding identification of visual problems among school children.

The tables 2.2.1 and 2.2.2 represented the mean pre and post test knowledge regarding identification of visual problems. The paired t-test was carried out and it was found to be invariably significant at P< 0.001 level, hence null hypothesis (H_{01}) is rejected and research hypothesis H_1 was accepted. It evidence that the Structured Teaching Programme (STP) is significantly effective on improving the knowledge and skill of teachers regarding identification of visual problems among school children.

Section-3: Assessment of correlation between knowledge and skill of teachers regarding identification of visual problems among school children.
Table 3.1: Correlation between the knowledge and skill
n=100

Sno	Knowledge	Skill
1	About general information on visual problems	0.999**
2	About refractive error	0.9995**
3	About short sightedness	0.998**
4	About farsightedness	0.99**
5	About crossed eye	0.9991**
6	Over all knowledge	0.9996**

** Correlation is significant at the 0.01 level.

The table 3.1 depicts the linear relationship between the knowledge and skills of teachers regarding identification of visual problems. The correlation coefficient 'r' value (Karl Pearson correlation) was computed to determine the relation between the overall knowledge and skills and it was found to be r = 0.9996, which was significant at 0.01 level. It evidence that higher knowledge on overall aspects of visual problems in school children and higher in skills of identification of visual problems. The table also shows that r obtained for the difference aspects of knowledge with skill and all were found to be significant at 0.01 level.

Research Hypothesis-2

H_2: There is a significant correlation between knowledge and skill of teachers regarding identification of visual problems among school children.

The above table 3.1 shows the linear correlation between knowledge and skill regarding identification of visual problems. The correlation between the knowledge and skill were significant. So, the null hypothesis (H_{02}) was rejected and research hypothesis H_2 was accepted.

Section-4: Association between knowledge with selected demographic variables

Table 4.1: Association between knowledge and selected demographic variables of teachers.

n=100

Demographic variables	Sample (n)		Knowledge				Chi-square χ^2 -value
	No. (100)	%	<Median		≥ Median		
			No. (72)	%	No. (28)	%	
1.Age (years)							12.14, df=3, S
20-30	29	29	18	25	11	39.28	
31-40`	43	43	37	51.38	6	21.42	
41-50	21	21	15	20.83	6	21.42	
51-60	7	7	2	2.77	5	17.85	
2.Education							1.986, df=1, NS
Diploma/in education/TTC	47	47	37	51.38	10	35.71	
B.Ed/BSc/BCom	53	53	35	48.61	18	64.28	
3.Working experience							0.202, df=3, NS
1-5	42	42	30	41.66	12	42.85	
6-10	37	37	27	37.5	10	35.71	
11-15	12	12	9	12.5	3	10.71	
16 & above	9	9	6	8.33	3	10.71	
4. Subject taught						17.85	1.97, df=3, NS
Science	24	24	19	26.38	5		
Social	28	28	19	26.38	9	32.14	
Mathematics	19	19	15	20.83	4	14.28	
Others	29	29	19	26.38	10	35.71	
5. Class taught							4.742, df=2, NS
Primary	48	48	38	52.77	10	35.71	
Upper primary	30	30	22	30.55	8	28.57	
Both	22	22	12	16.66	10	35.71	
6.Previous source of information							0.0635, df=4, NS
TV/Radio	34	34	25	34.72	9	32.14	
Friends/ Relatives	14	14	10	13.88	4	14.28	
Colleagues/health worker	7	7	5	6.94	2	7.14	
News paper/Magazinees	28	28	20	27.77	8	28.57	
Self experienced	17	17	12	16.66	5	17.85	

Note: S-Significant at 5% level(p<0.05); NS- Not significant at 5% level(p>0.05)

The table 4.1 represents the Chi-square value computed for Association between knowledge and selected demographic variables of teachers. The table depicts that the demographic variables such as Age shows a significant association with the pre test level of knowledge. Other demographic variables such as, Education, Working experience, Subject taught, Class taught and Source of information shows no statistical significant association with the pre test level of knowledge at 5% level of significant.

Research Hypothesis-3a

H_{3a}: There is a significant association between knowledge and selected socio demographic variables of teachers.

The results of Chi-square analysis presented in table 4.1 indicated that there was significant association between knowledge scores with subject taught and class taught. Hence the null hypothesis H_{03a} was rejected and Research Hypothesis H_{3a} was accepted.

Table 4.2: Association between skill and selected demographic variables of teachers.
n=100

Demographic variables	Sample (n) No. (100)	Sample (n) %	Skill <Median No. (51)	Skill <Median %	Skill ≥ Median No. (49)	Skill ≥ Median %	Chi-square χ² -value
1.**Age (years)** 20-30	29	29	17	17	12	12	df=3,3.29 NS
31-40`	43	43	18	18	25	25	
41-50	21	21	11	11	10	10	
51-60	7	7	5	5	2	2	
2.**Education** Diploma/ in education/TTC	47	47	25	25	22	22	df=1,103.72 S
B.Ed/BSc/BCom	53	53	26	26	27	27	
3.**Working experience** 1-5	42	42	18	18	24	24	df=3,2.391 NS
5-10	37	37	20	20	17	17	
11-15	12	12	7	7	5	5	
16 & above	9	9	6	6	3	3	
4. **Subject taught** Science	24	24	15	15	9	9	df=3,74.54 S
Social	28	28	12	12	16	16	
Mathematics	19	19	11	11	8	8	
Others	29	29	13	13	16	16	
5. **Class taught** Primary	48	48	24	24	24	24	df=2,0.091 NS
Upper primary	30	30	16	16	14	14	
Both	22	22	11	11	11	11	
6.**previous source of information** TV/Radio	34	34	18	18	16	16	df=4,0.563 NS
Friends/ Relatives	14	14	6	6	8	8	
Colleagues/health worker	7	7	4	4	3	3	
News paper/Magazinees	28	28	14	14	14	14	
Self experienced	17	17	9	9	8	8	

Note: S-Significant at 5% level(p<0.05); NS- Not significant at 5% level(p>0.05)

The table 4.2 represents the Chi-square value computed for Association between skill and selected demographic variables of teachers. The table depicts that the demographic variables such as Education status and subject taught shows a significant association with the pre test level of skill. Other demographic variables such as age, Working experience, Class taught and previous source of information regarding visual problem shows no statistical significant association with the pre test level of skill at 5% level of significant.

Research Hypothesis-3b
H_{3b}: There is a significant association between skill and selected socio demographic variables of teachers.
        The results of Chi-square analysis presented in table 4.2 indicated that there was significant association between skill scores with Education status and subject taught . Hence the null hypothesis H_{03b} was rejected and Research Hypothesis H_{3b} was accepted.

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