# A Study to Assess the Effectiveness of Planned Teaching Programme on Knowledge Regarding Management of Patients with Organophosphorus Poisioning among B.Sc Nursing 4th Year Students of Murari Lal Memorial School and College of Nursing Solan (H.P)

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**Abstract:** *Organophosphate poisoning results from exposure to organophosphates (OPs), which cause the inhibition of AChE is critical for nerve function, so the irreversible blockage of this enzyme, which causes acetylcholine accumulation, results in muscle overstimulation. This causes disturbances across the cholinergic synapses and can only be reactivated very slowly, if at all. Paraoxonase (PON1) is a key enzyme involved in OP pesticides and has been found to be critical in determining an organism's sensitivity to OP exposure. Consumption of OP poison causes many physiological changes which includes, Mydriasis, Bronchodilatation, urinary retention and hypoglycemia. Other symptoms include, tachycardia, hypertension, bradycardia, AV block, bronchospasm, respiratory muscle weakness, as primary symptoms and bronchorrhoea, aspiration pneumonitis, initial fasciculation, paralysis of respiratory muscles, CNS depression, agitation and delirium as secondary symptoms. Initial assessment of patient who consumed OP poisoning includes checking ABC. Lavage is considered in a highly toxic pesticide poisoning case that arrives at hospital within 1-2 hrs. Naso Gastric tube (NG tube) is passed to decompress the stomach and to suck out its content. After aspirating the stomach content, water or normal saline is given in lots through NG tube. Patient's airway is ensured, and oxygen is provided, lateral position is maintained and patient is observed for convulsions. Atropine is administered, mean while an intravenous infusion is started with normal saline. Pupils are observed for dilatation and lungs for crepitations. If the patient is unconscious he/she is intubated with an endotracheal tube to minimize the risk of aspiration and to facilitate respiratory care.*

**Keywords:** Organophosphorus poisoning, Atropine, Acetylcholine

## 1. Introduction

The saying goes, "Health is wealth." Healthy living is not a difficult step; it is merely about making some changes in life style. Disease or illness can really mean a downturn in our lives.[1] Personality refers to all that a person is, feels, and does, either consciously or unconsciously, as manifested in interactions with the environment. Behavior is an expression of personality and is defined as all the activity of which a human being is capable. It is a person's never ending attempt at adjustment to the environment and is determined by unmet needs. When needs are not met some individuals try to commit suicide, and a commonest method is by consuming poison.[2] Organophosphate poisons are the group of potent nerve agents, functioning by inhibiting the enzymes choline easterase. Organophosphorus poisoning occurs after dermal, respiratory, or oral exposure. Any substance that impairs health or destroys life when ingested, inhaled, or absorbed by the body in relatively small amounts is known as poisons .Many experts state that it is impossible to categorize any chemical as either safe or toxic and that the real concern is the risk or hazard associated with the use of any substance.[3]

### Objectives

1) To assess the pre test knowledge regarding the management of patients with organophosphorus poisoning among B.Sc nursing 4th year students
2) To assess the post test knowledge regarding management of patients with organophosphorus poisoning among B.Sc nursing 4th year students
3) To assess the effectiveness of the planned teaching program regarding management of patients with organophosphorus poisoning among B.Sc. nursing 4th year students.
4) To find out the association between pre test knowledge score with selected academic variables regarding management of patients with organophosphorus poisoning among B.Sc nursing 4th year students.

## 2. Methodology

A quantitative research approach was considered to be appropriate for the present study uses to assess the effect of planned teaching program on management of patients with organophorous poisiong among B.sc (N) 4th year students of Murari Lal School College of nursing, Solan in Himachal Pradesh. Sample of study was 40 samples and total enumeration sampling technique was employed in the study.

The tool was formulated after an extensive review of literature and discussion with the experts and guides. The tool was consisting of three parts:

**Part-I: Socio demographic variables:** The consisted of personal and academic profile of participants.

**Part-II: Self structured knowledge questionnaire:** It consisted of 30 questions to assess the knowledge regarding management of patients with organophorous poisiong among B.sc (N) 4th year students of Murari Lal School College of nursing, Solan in Himachal Pradesh.

**Part-III: Planned teaching programme:**
It consisted of systematically designed planned teaching programme regarding the management of patients with organophorous poisiong among B.sc (N) 4th year students of Murari Lal School College of nursing, Solan in Himachal Pradesh. To ensure content validity of the tool regarding the relevance of items, the tool was submitted to 7 experts of different field of nursing. Pilot study was conducted in Shimla nursing college Annandale, Shimla (HP). Test- retest method was used to check the reliability of knowledge questionnaire. The reliability was 0.82, which was calculated by Karl Pearson correlation coefficient formula. Study was conducted after the approval from the ethical and research committee of Murari lal memorial college of Nursing, Solan (HP).

## 3. Results

**Plan of analysis:**
Data was planned to be analyzed on the basis of objective stated
- The data collected by the researcher was transferred to a master sheet prepared for each section of tool
- Descriptive as well as inferential statistics was used to achieve the objectives of the study.
- Frequency and percentage distribution for the analysis of the demographic variables.
- Analysis and interpretation of data was done according to the objectives and by using descriptive (mean, median and standard deviation) and inferential statistics (chi square and t- test).
- Result of this study was shown in the form of tables and figures. The level of significance selected for the study was $p < 0.05$ level.

**Organization of the findings**
**The analyzed data were organized according to the objectives and presented under the following section.**

**Section I:** Frequency and percentage wise distribution of subject according to their demographic variables.
**Section II:** Assess the Pre-test knowledge regarding management of patients with organophosphorus poisoning among B.sc nursing 4th year students of Murari Lal Memorial school and college of nursing Solan (H.P).
**Section III:** Assess the post test knowledge regarding management of patients with organophosphorus poisoning among B.Sc nursing 4th year students of Murari Lal Memorial school and college of nursing Solan (H.P).
**Section IV:** Assess effectiveness of planned teaching programme regarding management of organophosphorus poisoning among B.sc nursing 4th year students of Murari Lal Memorial school and college of nursing Solan (H.P).

**Section V:** This section consists of:
a) Significance difference between pre test and post test knowledge score of subjects regarding management of organophosphorus poisoning among B.sc nursing 4th year students of Murari Lal Memorial school and college of nursing Solan (H.P).
b) Association of post test knowledge scores and their selected socio- demographic variables.

**Section-1**
**Description of demographic characteristics of subjects.**

**Table 4.1:** Frequency and percentage wise distribution of subject according to their demographic variables, (N=40)

| Demographic variables | | Frequency | Percentage |
|---|---|---|---|
| Age | 19-20 years | 0 | 0.0% |
| | 21-22 years | 40 | 100.0% |
| | 23-24 years | 0 | 0.0% |
| Gender | Male | 0 | 0.0% |
| | Female | 40 | 100.0% |
| Religion | Hindu | 37 | 92.5% |
| | Muslim | 3 | 7.5% |
| | Sikh | 0 | 0.0% |
| Educational status of father | No formal education | 0 | 0.0% |
| | Primary education | 0 | 0.0% |
| | Secondary education | 21 | 52.5% |
| | Graduate and above | 19 | 47.5% |
| Educational status of mother | No formal education | 0 | 0.0% |
| | Primary education | 0 | 0.0% |

| | Secondary education | 33 | 82.5% |
|---|---|---|---|
| | Graduate and above | 7 | 17.5% |
| Place of residence | Rural | 31 | 77.5% |
| | Urban | 9 | 22.5% |
| Occupation of father | Private sector employee | 20 | 50.0% |
| | Government sector employee | 19 | 47.5% |
| | Self employed | 1 | 2.5% |
| Occupation of mother | Private sector employee | 8 | 20.0% |
| | Government sector employee | 8 | 20.0% |
| | Self employed | 8 | 20.0% |
| | Home maker | 16 | 40.0% |
| Do you have previous knowledge | Yes | 40 | 100% |
| | No | 0 | 0.0% |
| Source of information | Internet/Books | 10 | 25.0% |
| | Social media | 10 | 25.0% |
| | Family members | 9 | 22.5% |
| | Clinical exposure | 7 | 17.5% |
| | All of above | 4 | 10.0% |
| Clinical exposure | Yes | 40 | 100% |
| | No | 0 | 0.0% |
| Have you ever assisted /handled acute poisoning patients | Yes | 34 | 85.0% |
| | No | 6 | 15.0% |
| Have you ever attended any educational program | Yes | 10 | 25.0% |
| | No | 30 | 75.0% |

**Table 4.1** reveals distribution of subjects according to their age (in years), gender, place of residence, father's education, mother's education, occupation of father, occupation of mother, source of information and previous knowledge.

The study participants included age range of 21-22 years, out of 40 subjects all are female. On the basis of religion, 92.5% subjects were Hindu and 7.5% were Muslim. According to educational status of father 52.5% of students father's had secondary education and 47.5% were graduate and above. 82.5% of students mother's had secondary education and only 17.5% were graduate and above. Maximum 77.5% students resided in rural area whereas 22.5% students were from urban area. 50% of students father's were private employees, 47.5% were government employee and 2.5% were self employed. As per students mother's occupation 40% of subjects were home maker, 20% subjects were self-employed, 20% were in government sector and 20% subjects were private employee. All subjects had previous knowledge regarding management of patient with OP poisoning. 85% of subjects had assisted/ handled acute poisoning patients in clinical setting and all subjects had clinical exposure to critical and emergency setting. 75% of subjects had never attended any educational programme on management/ first aid of poisoning while 25% of subjects had attended.

## Section-II

**Assess the Pre-test knowledge regarding management of patients with organophosphorus poisoning among B.sc nursing 4th year students of Murari Lal Memorial school and college of nursing Solan (H.P).**

**Table 4.2:** Frequency and percentage distribution of student pre-test knowledge score regarding management of patients with organophosphorus poisoning.
Criterion Measure, **(N=40)**

| Score Level | Frequency | Percentage |
|---|---|---|
| Poor Knowledge.(0-9) | 15 | 37.5% |
| Average Knowledge.(10-20) | 25 | 62.5% |
| Good Knowledge.(21-30) | 0 | 0% |

Maximum Score=30 Minimum Score=0

**Table 4.2:-** Showing that 15(37.5%) subjects had poor knowledge score, 25(62.5%) subjects had average knowledge level and no one had good knowledge regarding management of patient with organophorous poisoning.

Hence, it can be concluded that majority of subjects i.e. 62.5% having average knowledge before administration of structured teaching programme.
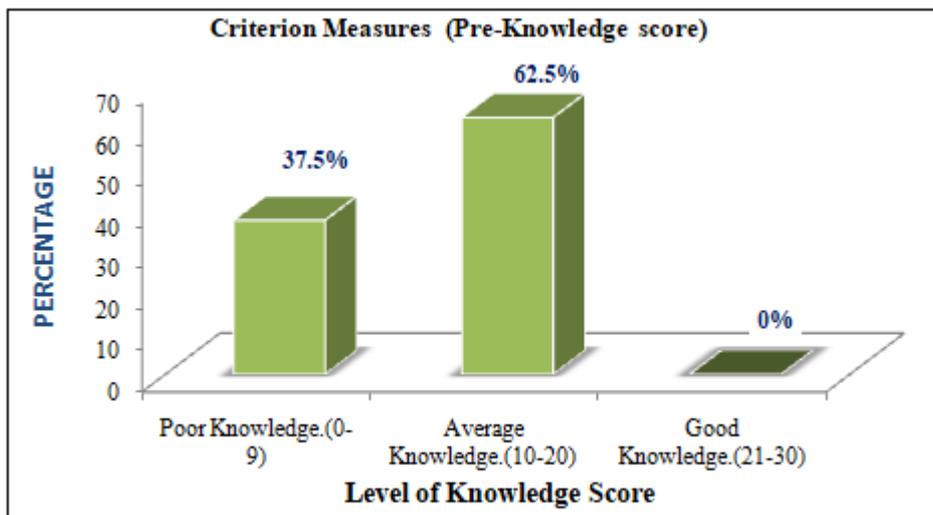
**Figure 4.1:** Percentage distribution of subjects according to their level of knowledge score in pre-test.

**Table 4.3:** Mean, SD and mean percentage of pretest knowledge score of students regarding management of patients with organophosphorus poisoning.

**Pre-Test Knowledge Score (N=40)**

| Descriptive Statistics | Mean | S.D. | Median Score | Maximum | Minimum | Range | Mean% |
|---|---|---|---|---|---|---|---|
| Pretest Knowledge | 10.30 | 3.082 | 10 | 16 | 4 | 12 | 34.30 |

Maximum Score=30  Minimum Score=0

**Tables 4.3** illustrate the pre-test mean, SD and mean percentage knowledge score of subject. The analysis reveal that mean knowledge score is 10.30±3.082 which is 34.30% of the total mean knowledge percentage score. The above result substantiate that subjects had average knowledge regarding management of patients with organophosphorus poisoning.

**Section-III**
Assess the post test knowledge regarding management of patients with organophosphorus poisoning among B.Sc nursing 4th year students of Murari Lal Memorial school and college of nursing Solan (H.P).

**Table: 4.4:** Frequency and percentage distribution of students regarding management of patients with organophosphorus poisoning in post-test knowledge score.

**Criterion Measure (N=40)**

| Score Level | Frequency | Percentage |
|---|---|---|
| Poor Knowledge.(0-9) | 0 | 0% |
| Average Knowledge.(10-20) | 3 | 7.5% |
| Good Knowledge.(21-30) | 37 | 92.5% |

Maximum Score=30 Minimum Score=0

Table 4.4 and Fig 4.2 demonstrate that in post test none of the students had poor knowledge, 3(7.5%) of students had average knowledge and utmost 37(92.5%) students had good knowledge score regarding management of patients with organophosphorus poisoning.
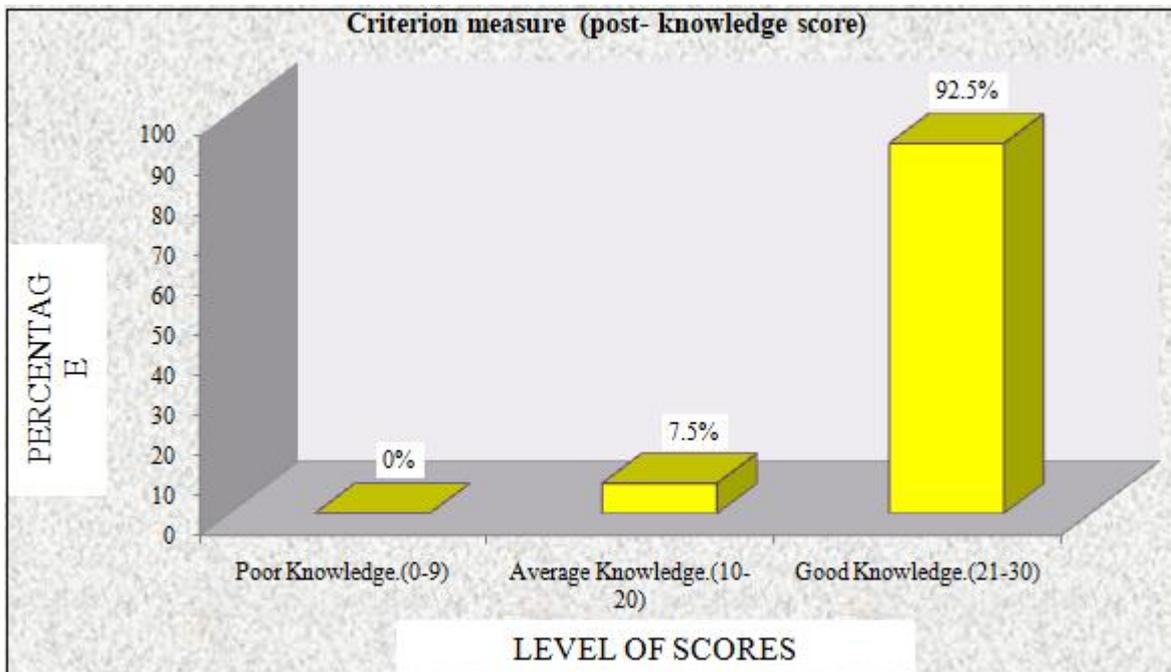
**Figure 4.2:** Percentage distribution of subjects according to their level of knowledge score in post test

**Table 4.5:** Mean, SD and mean percentage of post-test knowledge score of students regarding management of patients with organophosphorus poisoning.
Post-test knowledge score
(N=40)

| Descriptive Statistics | Mean | S.D. | Median Score | Maximum | Minimum | Range | Mean% |
|---|---|---|---|---|---|---|---|
| Posttest Knowledge | 26.13 | 2.803 | 26 | 30 | 20 | 10 | 87.10 |

Maximum Score=30  Minimum Score=0

**Table4.5** illustrates the mean, SD and mean percentage of post test knowledge score among students regarding management of patients with organophosphorus poisoning. The analysis reveals mean knowledge score is 26.13±2.80 which is 87.10% of total mean knowledge percentage score. The above results substantiate that the subjects under the study had good knowledge regarding management of patients with organophosphorus poisoning.

**Section-IV**
Asses effectiveness of planned teaching programme regarding management of organophosphorus poisoning among B.sc nursing 4th year students of Murari Lal Memorial school and college of nursing Solan (H.P

**Table 4.6:** Percentage wise distribution of subjects according to the mean percentage of pre test and post test knowledge score and their difference.
Diagram Showing Individual Score Gain (Effectiveness)

| Pre test knowledge | | | Post test knowledge | | | Difference in mean % |
|---|---|---|---|---|---|---|
| Mean | SD | Mean% | Mean | SD | Mean% | |
| 10.30 | 3.08 | 34.33% | 26.13 | 2.80 | 87.08% | 52.75% |

Table 4.4 reflected the mean, SD, mean percentage and difference between the pre test and post test knowledge score. In the pretest mean knowledge score was 10.30±3.79 which was 34.33% of total mean knowledge score percentage. In post test mean knowledge score was 26.13±2.80 which was 87.08% of total mean knowledge

score percentage. The difference in pre test and post test mean knowledge score was 52.75%.

Hence it was interpreted that planned teaching programme was effective in enhancing the knowledge among B.sc nursing 4th year students programme regarding management of organophosphorus poisoning.
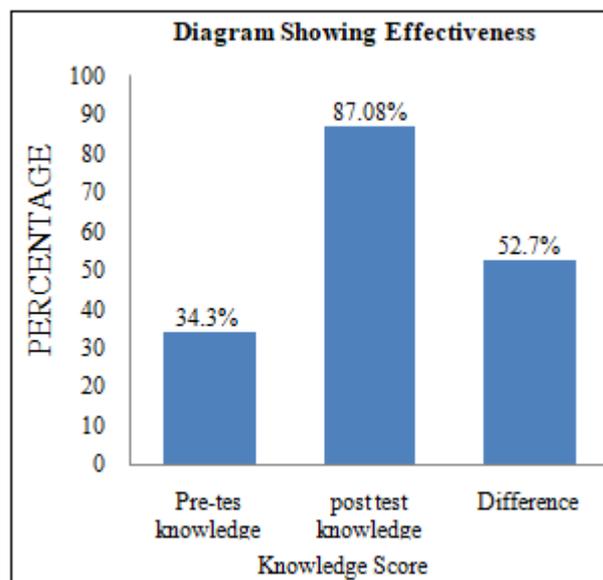


**Figure 4.3:** Percentage wise distribution of subjects according to the mean percentage of pre test and post test knowledge score and their difference.

**Section-V**

This section consists of:
a) **Significance difference between pre test and post test knowledge score of subjects regarding management of organophosphorus poisoning among B.sc nursing 4th year students of Murari Lal Memorial school and college of nursing Solan (H.P).**

b) **Association of post test knowledge scores and their selected socio- demographic variables.**

Hypothesis testing was done by using 't' test and chi-square test.
1) H1: There will be significant difference between pre test knowledge score and post test knowledge score regarding management of patients with organophosphorus poisoning.
2) H2: There will be significant association between post test knowledge score with socio-demographic variables.

**H1: There will be significant difference between pre test knowledge score and post test knowledge score regarding management of patients with organophosphorus poisoning.**

**Table 4.7:** Comparison of mean pre test and post test knowledge score of subjects regarding management of organophosphorus poisoning among B.sc nursing 4th year students of Murari Lal Memorial school and college of nursing Solan (H.P), (N=40)

| Knowledge | Mean±S.D. | Mean% | Range | Mean Diff. | Paired T Test | P value | Table Value at 0.05 |
|---|---|---|---|---|---|---|---|
| Pretest Knowledge | 10.3±3.082 | 34.30 | 4-16 | 15.83 | 27.84 *Sig | <0.001 | 2.02 |
| Posttest Knowledge | 26.13±2.803 | 87.10 | 20-30 | | | | |

**\*\* Significance Level 0.05        Maximum=30 Minimum=0**

Table 4.7 depicts paired 't' test was calculated to analyze the difference between pre test and post test knowledge scores. The calculated paired T test value is 27.84 which are greater than the table value (2.02). This shows the highly significance difference i.e. 15.83, between pre test and post test.

Hence the stated research hypothesis H1 for knowledge is accepted (p<0.05). It is interpreted that the difference observed in the mean score values of pre-test and post-test were true difference and not by chance.

**H2: There will be significant association between post test knowledge score with socio-demographic variables.**

**Table 4.8:** Association of post test knowledge scores and their selected socio- demographic variables. (N=40)

| Demographic Variables. | | Good Knowledge | Average Knowledge | Chi Test | P Value | df | Table Value | Result |
|---|---|---|---|---|---|---|---|---|
| Age | 19-20 years | 0 | 0 | N.A | | | | |
| | 21-22 years | 37 | 3 | | | | | |
| | 23-24 years | 0 | 0 | | | | | |
| Gender | Male | 0 | 0 | N.A | | | | |
| | Female | 37 | 3 | | | | | |
| Religion | Hindu | 34 | 3 | 0.263 | 0.608 | 1 | 3.841 | Not Significant |
| | Muslim | 3 | 0 | | | | | |
| | Sikh | 0 | 0 | | | | | |
| Educational status of father | No formal education | 0 | 0 | 3.585 | 0.058 | 1 | 3.841 | Not Significant |
| | Primary education | 0 | 0 | | | | | |
| | Secondary education | 21 | 0 | | | | | |
| | Graduate and above | 16 | 3 | | | | | |
| Educational status of mother | No formal education | 0 | 0 | 0.563 | 0.453 | 1 | 3.841 | Not Significant |
| | Primary education | 0 | 0 | | | | | |
| | Secondary education | 31 | 2 | | | | | |
| | Graduate and above | 6 | 1 | | | | | |
| Place of residence | Rural | 29 | 2 | 0.218 | 0.640 | 1 | 3.841 | Not Significant |
| | Urban | 8 | 1 | | | | | |
| Occupation of father | Private sector employee | 20 | 0 | 3.585 | 0.167 | 2 | 5.991 | Not Significant |
| | Government sector employee | 16 | 3 | | | | | |
| | Self employed | 1 | 0 | | | | | |
| Occupation of mother | Private sector employee | 7 | 1 | 2.162 | 0.539 | 3 | 7.815 | Not Significant |
| | Government sector employee | 8 | 0 | | | | | |
| | Self employed | 8 | 0 | | | | | |
| | Home maker | 14 | 2 | | | | | |
| Do you have previous knowledge | Yes | 37 | 3 | N.A | | | | |
| | No | 0 | 0 | | | | | |
| Source of information | Internet/Books | 10 | 0 | 5.222 | 0.265 | 4 | 9.488 | Not Significant |
| | Social media | 10 | 0 | | | | | |
| | Family members | 7 | 2 | | | | | |
| | Clinical exposure | 6 | 1 | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Clinical exposure | All of above | 4 | 0 | N.A | | | | |
| | Yes | 37 | 3 | | | | | |
| | No | 0 | 0 | | | | | |
| Have you ever assisted /handled acute poisoning patients | Yes | 32 | 2 | 0.855 | 0.355 | 1 | 3.841 | Not Significant |
| | No | 5 | 1 | | | | | |
| Have you ever attended any educational program | Yes | 8 | 2 | 3.003 | 0.083 | 1 | 3.841 | Not Significant |
| | No | 29 | 1 | | | | | |

Table 4.8 describes that the association of post test knowledge scores and their selected socio- demographic variables. There was no significant association found between the knowledge regarding management of patients with organophosphorus poisoning in post-test when compared with selected demographic variables. The calculated chi-square value for religion is 0.263 and the table value is 3.841.The calculated chi-square value for educational status of father is 3.585 and the table value is 3.841.The calculated chi-square value for educational status of mother is 0.563 and the table value is 3.841.The calculated chi-square value for place of residence is 0.218 and the table value is 3.841.The calculated chi-square value for occupation of father is 3.585 and the table value is 5.991.The calculated chi-square value for occupation of mother is 2.162 and the table value is 7.815.The calculated chi-square value for source of information is 5.222 and the table value is 9.488.The calculated chi-square value for subjects has ever assisted/ handled acute poisoning patient in clinical setting is 0.855 and the table value is 3.841.The calculated chi-square value for subjects have ever attended any educational program is 3.003 and the table value is 3.841.Therefore, the calculated chi-square values were less than the table value at the 0.05 level of significance. Hence, stated hypothesis is rejected for above selected variables.

## 4. Conclusion

- The findings revealed that knowledge regarding management of patients with organophosphorus poisoning was poor before imparting the structured teaching programme but the knowledge level increased to good after implementation of structure teaching programme.
- Calculated T value 27.848 was greater than the table value 0.05 which concluded that there is significant difference between pre test and post test knowledge score. Therefore, $H_1$ is accepted.
- There was no significant association between knowledge regarding management of organophosphorus poisoning among B.Sc (N) 4th year students and demographic variables.

## 5. Future Scope

**Nursing education:**

- Knowledge of nursing students will be improved.
- Up to date knowledge will be provided
- Practices of the nursing students can be improved and corrected through demonstrations and re-demonstrations
- Proper techniques can explain to improve effectiveness of practices.

**Nursing administration:**

- Administrators have to educate the students through media regarding the management of organophosphorus poisoning.
- Various seminars sessions of workshops can be conducted.

**Nursing practice**

- Nurses can improve the knowledge level of nursing students through practicing.
- Nurses can improve their practices by learning the advanced procedures.
- Quality of nursing care can be improved.

**Nursing research**

- The findings of the study would help to expend the scientific body of professional knowledge upon which further research can be conducted.
- For formulation of evidence based practices in nursing profession.

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