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**AWARENESS ON PROCUREMENT, STORAGE AND HANDLING OF  
ORGANS FOR TRANSPLANTATION.****Sheela Pavithran\*, Nimisha Raju<sup>1</sup>, Poonam Krishna<sup>2</sup> and Remya Raj<sup>3</sup>**

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**ABSTRACT**

Study regarding awareness on procurement, storage and handling of organs for transplantation among the students of nursing programmes, a descriptive study was conducted with the objectives to 1) determine the level of awareness of students regarding procurement, storage and handling of organs for transplantation, 2) find the association between level of awareness and selected variables and 3) prepare an information booklet on procurement, storage and handling of organs for transplantation. Data were collected from 60 Undergraduate and Post-Graduate nursing students selected by disproportionate stratified random sampling using a structured knowledge questionnaire. Level of awareness was categorized as poor, average and good. Data were analyzed using frequency, percentage and chi- squares. The study

results indicate that majority (33, 55%) of the students had average level of awareness and none had good level of awareness. The mean awareness score was 10.3 against the maximum score of 31. Procurement (77%) and storage of the organs (70%) were the major areas of poor awareness. The Post-Graduate [MSc (N)] students had better knowledge followed by Post Basic B Sc (N). Steady increase in level of knowledge was observed in the Undergraduate programme where 60% fourth year students had average level of awareness followed by II and III year BSc (N) with 27%. Out of the 60 students only (37%) were willing to donate their organs while they are alive, but majority (90%) were willing to donate their organs after death. No association was found between level of awareness and selected variables ( $p>0.05$ ). The findings of the study suggest the need for awareness regarding different aspects of organ donation.

**KEYWORDS:** Awareness, Procurement, Storage, Handling, Organs Transplantation, nursing students.

## INTRODUCTION

Organ donation is a noble act which can save life of many. Organ transplantation is one of the most significant advancement in the field of medicine in the latter half of 20<sup>th</sup> century. The concept of tissue replacement, organ transplantation is based on the idea that patients who have end stage disease of the critical organs can be kept alive beyond the useful life of organ and tissue. According to WHO, around 160,928 organ transplantations have been done in India till 2014. Among that 79,642 were kidney transplantations, 26,422 were liver transplantations, 9,864 were heart transplantations, 45,000 were cornea transplantations and two hand transplantations.<sup>[1]</sup>

The supply of organs of high quality and efficacy has always been one step of extreme importance in the overall multi-disciplinary approach to transplantation and was identified as such early on in-service development. However, improper methods of procurement, handling or storage including the faults in temperature maintenance have multitude of effects (both supportive and destructive) on mammalian cell biology.

When a person dies, the heart stops pumping blood around the body, thus depriving the cells of oxygen, which rapidly begins to die. Decomposition starts almost immediately, with the skin going through several changes as the blood stops circulating leaving the body an ashen colour. However, different cells die at different times. For example, brain cells die within a few minutes, whilst the skin cells can survive over 24 hours.<sup>[2]</sup> So the organs have to be dissected at the appropriate time, stored at preferred temperature in suitable solutions. When brain stem death has been conformed, management of the donor is aimed at preserving the functional integrity of the organs to be procured. Brain stem death produces profound metabolic and neuroendocrine disturbances leading to cardiovascular instability.<sup>[3]</sup> Careful monitoring and management of fluid balance is essential. In all these inevitable aspects, nurses play a vital part of the transplantation team in this present scenario.

Nurses are involved in all the steps from organ procurement till the patient is discharged from the hospital and even during the follow up. Awareness regarding procurement, storage and handling of organs by staff nurses help to reduce the post-transplant complications to the

patients and improve their quality of life. It will also help the nurses to improve the scope of nurse in transplant unit and new advancement including air ambulance services.

## **MATERIALS AND METHODS**

A descriptive survey design was adopted for the study. The study population consists of students of Undergraduate and Post-graduate nursing programmes of a selected Nursing College in Central Kerala. Study subjects consisted of 60 students who were selected by disproportionate random sampling technique. Students of first year B Sc Nursing programme were excluded in the study. Ethical clearance was obtained from the institutional Theses Review Committee, Principal of the College and an informed consent from each student. Data were collected using self administered awareness questionnaire developed by the investigators. The reliability of the tool was established by test-retest method with a reliability score of 0.74. Questionnaire consisted of 31 items on awareness. Each correct answer had a score of one and wrong answer had a score of zero. Based on the total score, level of awareness was categorized as poor (0-10), average (11-20) and good (21-31).

## **RESULTS**

The data obtained were analyzed on the basis of objectives of the study by both descriptive and inferential statistics using SPSS V.21:0 and are organised and presented under the following headings.

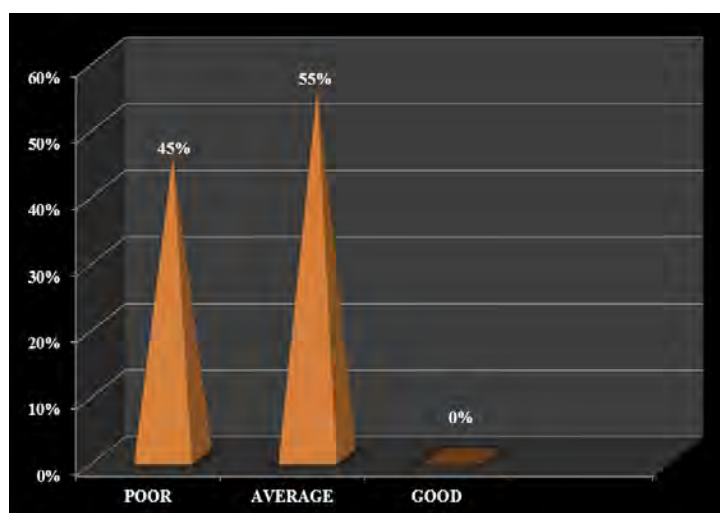
1. Sample characteristics
2. Level of awareness.
3. Comparison of level of awareness
4. Association between level of awareness and selected variable

### **1. Sample characteristics**

Among the study subjects, more than half (31, 51.7%) were between 17-20 years of age, majority (57, 95%) are females and B Sc (N) students (45, 75%). Only 3(5%) subjects had working experience while 32(59%) had taken care of patients posted for organ transplantation. Nearly half 26(43.3%) subjects had family members working in the health field and only 15(25%) had undergone awareness programmes regarding organ transplantation. There were 3(5%) subjects who had relative who donated and received organs. Regarding readiness to donate own organ, 22(36.7%) were ready to donate their organ while they are alive whereas 54(90%) were ready to donate their organ after their death.

## 2. Level of awareness

Based on the total score, the level of awareness was categorized into good (score 21-31), average (11-20) and poor (0-10). Level of awareness presented in figure depicts that majority of the subjects (33, 55%) of the subjects had only average level of awareness and none had good level of awareness on organ transplantations which include awareness on procurement, storage and handling of organs for transplantation.



**Fig 1: Cone diagramme showing the overall level of awareness regarding organ transplantation**

In addition to the figure and percentage, mean and standard deviation awareness level is calculated and is presented in table 1.

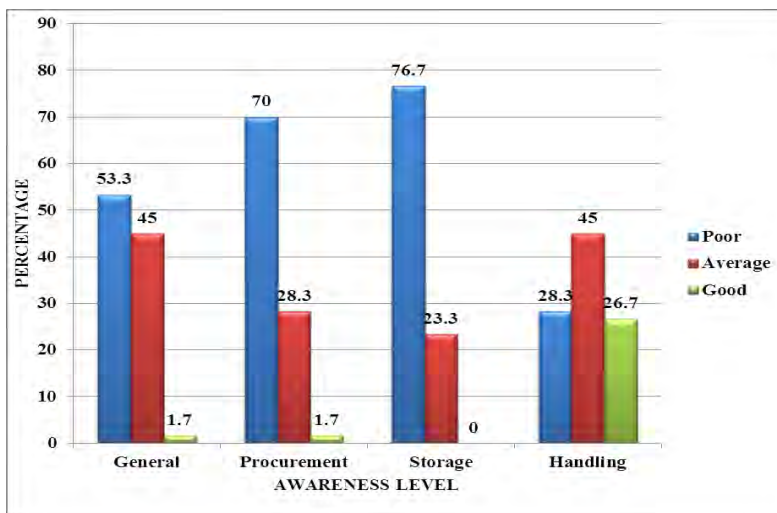
**Table 1: Mean and standard deviation of level of awareness.**

**n = 60**

Level of awareness					
Item	General aspects	Procurement	Storage	Handling	Total
<b>SD</b>	1.14	0.96	1.61	1.77	5.48
<b>Mean score</b>	2.42	1,05	3.57	3.33	10.37
<b>Highest possible score</b>	7	5	7	12	31

Data presented in table 1 show that average mean awareness score is only 10.37 and the maximum possible score is 31, indicating a poor level of overall awareness.

An area wise distribution of level of awareness is presented in figure 2.

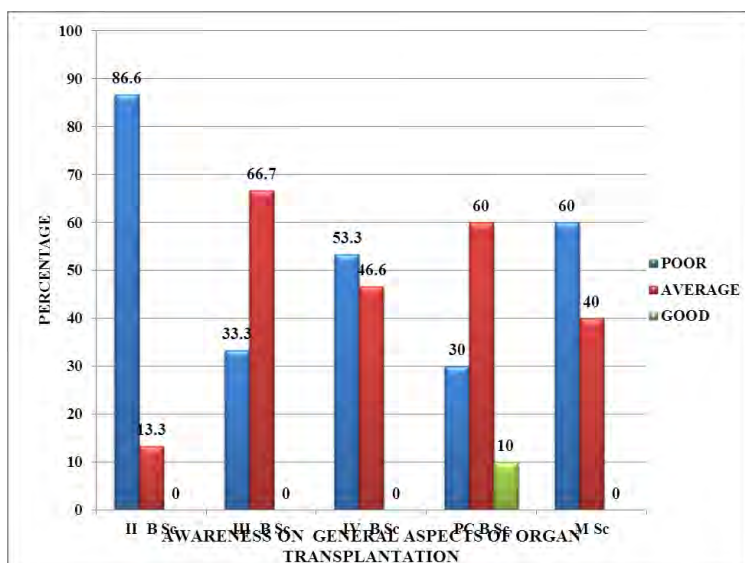


**Fig 2: Bar diagram showing awareness of subjects in different aspects of organ transplantation**

The data presented in figure 2 show that the students lack awareness in all the areas. Major areas which lack awareness are storage, where 76.7% have poor awareness and none have good awareness. In the area of procurement, 70% have poor awareness and about 1.7% has good awareness and in general area 53.3% have poor awareness. The area of handling of the organ is the area where student possess comparatively good awareness. ie, 26.7% with good awareness.

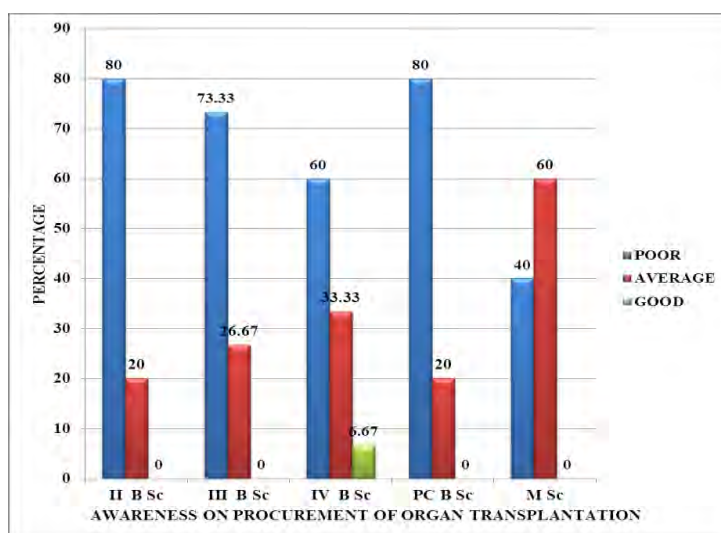
**3. Comparison of level of awareness**

A detailed comparison of awareness between different categories of subjects are computed and are presented in table 3-6.



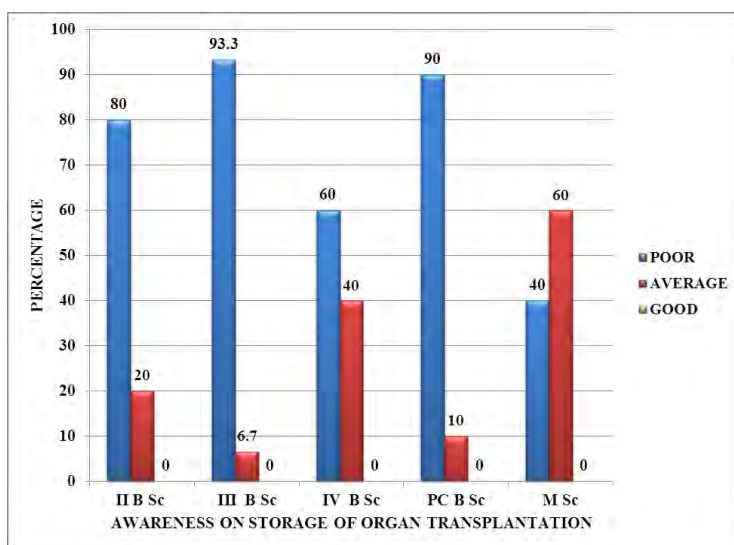
**Fig 3: Comparison of awareness in general aspects of organ transplantation**

Figure 3 illustrates the comparison of the level of awareness of subjects in general aspects of organ transplantation. It is observed from the figure that the awareness was poor among the II year B Sc (N) ie, 86.7% followed by 60% of M Sc Nursing students and 53.3% IV year B Sc Nursing students. Awareness regarding general aspects is comparatively better among the Post Basic B Sc (N) with 10% having good and 60% average level of awareness followed by III year B Sc Nursing with 66.7% with average level of awareness.



**Fig 4: Awareness of subjects in procurement of organs for transplantation**

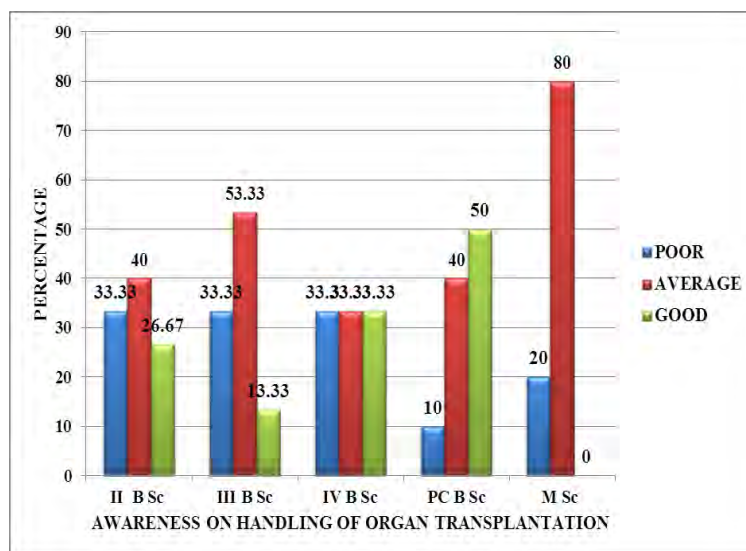
Figure 4 illustrates the level of awareness of subjects in procurement of organs for transplantation. The M Sc (N) students have better knowledge regarding procurement with 60% having average knowledge followed by 33% of IV year B Sc (N) with average level of awareness and 6.7% good knowledge.



**Fig 5: Knowledge of subjects in storage of organs for transplantation**



Figure 5 illustrates the awareness level of subjects regarding storage of organs for transplantation. More than 90% students of III year B Sc (N) and Post Basic B Sc (N) have poor level of awareness followed by 80% of II year B Sc (N). M Sc (N) students have better awareness with 60% having average level of awareness followed by 40% IV year B Sc. (N) with average level of awareness.



**Fig 6: Awareness of subjects in handling of organs for transplantation**

Figure 6 illustrates the level of awareness of subjects regarding handling of organs for transplantation. It is evident that 50% of the Post-Basic B Sc (N) students have good level of awareness regarding handling of organ followed by 33.3% IV year B Sc (N) and 26.7% of II year BSc (N).

#### 4. Association between level of awareness and selected variables

Association between level of awareness and selected variables could not for computed as there was limited number in different categories.

#### DISCUSSION

*The first objective of the study was to determine the awareness regarding procurement, storage and handling of organs for transplantation*

The study result showed that out of 60 students, (33, 55%) of students had only average level of awareness and one had good level of awareness regarding procurement, storage and handling of organs for transplantation.



A study conducted by Bidigare SA, Oermann MHO.<sup>[4]</sup> Department of Neurosurgery, Detroit Receiving Hospital and University Health Centre (1991) regarding the “Nurse’s attitude and knowledge regarding organ procurement”, knowledge deficits was identified in all the areas. Results indicated that although most nurses were supportive of organ procurement, there were aspects with which they were uncomfortable and others in which they lacked knowledge. The study results indicated need for additional awareness and education for nurses in all the areas of organ transplantation. This study result support the present study where none of the subjects had good knowledge on organ transplantation. Even though the former study was conducted among the staff nurses, its findings show that the subject lacked knowledge. So, it is needless to say that nursing students and nurses should be provide with sufficient teaching on organ transplantation. Now organ transplantation has been emerged as an important speciality. So, more focus need to be given on education of nurses. Curriculum should facilitate improvement in knowledge of organ transplantation and skill in caring for patients before and after the transplantation.

Tokalk I, Moray G, Erdal R, Karakayali H<sup>[5]</sup> (2006) conducted a study to assess knowledge and attitudes of high school students related to organ transplantation with an aim to identify student related factors that might affect organ transplantation and to use this information to develop some essential strategies, policies and education programmes. Two hundred students from an urban high school were surveyed with a questionnaire. After completing the first interview, the students underwent a training programme on organ transplantation. Analysis of the changes from before and after the educational programme to assess the programme’s effectiveness reports that prior to the training programme, 24.9% of the 189 respondents stated that they were aware about the organ transplantation. Before the training 14.3% of the respondent said that they were not aware about the organ transplantation, and this rate fell significantly to 7.2% after the programme was completed. In the present study, the students had inadequate awareness on different aspects of organ transplantation. In the present study, 55(91.7%) of the subject reported that they have knowledge about organ transplantation but in the actual analysis of different aspects of organ transplantation it is evident that all of them had only poor to average level of awareness (ie, 45% poor and 55% average). This shows that even though organ transplantation is dealt with in the curriculum, subjects lack in-depth knowledge on organ transplantation. There were 32(53.3%) of subjects who had taken care of patients after organ transplantation, still there were none with good awareness among the subjects. All these data point towards a need for organ transplantation especially because

more and more settings are performing organ transplantation and the number of people coming forward for organ transplantation is increasing steadily. Further, the present study had not included effect of an awareness program.

***The second objective of the study was to find the association between level of awareness and selected variables***

Association between the level of awareness and selected variables could not be computed as the subjects were less. The study conducted among nurses<sup>4</sup> to determine the attitude and knowledge on organ procurement reported that researchers could find difference between the unit in which nurses worked and the extent to which the nurses participated in care of patients for organ transplantation. Significant relationship also could be found between the fact that nurses cared for patients of organ donation and the degree of discomfort felt in obtaining consent, extent to which the nurses have participated in care and knowledge on organ procurement procedures. Thus the study reported that nurses' feeling regarding organ donation and degree of comfort in obtaining consent were correlated positively with higher knowledge score.

***The third objective was to prepare an information booklet on procurement, storage and handling of organs for transplantation***

In the study, it is found that majority (33, 55%) subjects possessed an average level of awareness and none had good knowledge. Since the subject had lack of awareness in all the aspects regarding organ transplantation, the study recommended a need for appropriate measures to improve the knowledge. Based on the findings, the researchers have prepared a booklet on organ transplantation. The booklet includes the steps in procurement, the temperature and the duration for storage of each organ, the measures for handling of the organs. The booklet also gives information regarding the roles and responsibilities of the nurses in organ transplantation.

A study conducted by Haley H, Alexander S, Zavala S<sup>6</sup> regarding „The role of advanced practise nurses in transplant centre' described that the study on the basis of the objective to characterise the role and integration of Advanced Practical Nurses in the existing transplant centres. The study was a descriptive study with results that the members of existing transplant staffing models were identified as license to practical nurses and registered nurses. The primary responsibilities of advanced practical nurses were both in-patient and out-patient before and after transplant and handling of organs while transplantation. Licensed practical

and registered nurses handled the pre transplant referral management and phone triage duties in transplantation unit. The study concluded that Advanced Practical Nurses play a vital role in management of transplant patients.

The present research study results clearly identified that there is a need for special educational programmes for students of nursing programmes regarding the procurement, storage and handling of organs for transplantation to increase the opportunity of nurses in transplantation units. The nurses are a vital part of organ transplantation unit as they are arranging the instruments and articles for transplantation caring of the cadaver, assisting in procurement and transplantation, maintaining the storage temperature, application of saline over the organ during implantation to prevent warm temperature and coordination of the procedure.

## CONCLUSION

The study findings show that students had only average (55%) level of awareness in spite of having dealt with the subject in course of study. As the number of organ transplantation and centres conducting such surgical procedures are increasing rapidly, it is mandatory that the nurses possess in-depth knowledge on all the aspects of organ transplantation. The study suggests an urgent need to educate both the nurses and nursing students regarding organ transplantation.

## ACKNOWLEDGEMENT

Investigators express deep sense of gratitude to all the students who participated in the study.

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