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"A Study to Assess the Effectiveness of Structured Teaching Programme on Knowledge and Practice Regarding Self Administration of Insulin Among Patient with Diabetes Mellitus Receiving Insulin at Apollo Speciality Hospitals, Nellore, Andra Pradesh, India."

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Abstract: -
Background:
India. Diabetes Mellitus, a chronic metabolic disorder characterized by hyperglycemia, is a significant global health challenge, with insulin therapy being a critical treatment for managing the condition. Proper knowledge and practice of insulin self-administration are essential for optimal diabetes control and prevention of complications.
Aim *This study aimed to assess the effectiveness of a Structured Teaching Programme on the knowledge and practice of insulin self-administration among patients with Diabetes Mellitus at Apollo Speciality Hospitals, Nellore, Andhra Pradesh,*
Materials and Methods: *This hospital based prospective study was conducted in Apollo speciality hospital Andhra Pradesh. variable used dependent variable: Knowledge on diabetes and self -administration of insulin Practice on Self administration of Insulin. Independent variable: was structured teaching programme on self – Administration of insulin Results: A pre-experimental one-group pre-test post-test design was employed, involving 60 diabetic patients using insulin. Data on demographic characteristics, knowledge, and practice of self-administration of insulin were collected using a checklist and questionnaire. The results showed a significant improvement in both knowledge and practice post-intervention. In the pre-test, 41.6% of participants had poor knowledge, 50% had average knowledge, and 8.4% had good knowledge of insulin self-administration. After the STP, 3.4% of participants had average knowledge, 63.3% had good knowledge, and 33.3% had excellent knowledge.*
In terms of practice, 21.7% of participants had moderate practice, while 78.3% had inadequate practice before the STP. Post-intervention, 13.4% of participants had moderate practice, and 86.6% demonstrated adequate practice in self-administration of insulin. The paired t-test showed a statistically significant difference between pre-test and post-test knowledge scores (Pre-test Mean = 13.5 ± 3.42, Post-test Mean = 27.3 ± 4.02, $t = 25.10$, $p < 0.00001$) and practice scores (Pre-test Mean = 13.4 ± 3.06, Post-test Mean = 20.7 ± 2.09, $t = 12.2$, $p < 0.05$).
Conclusion: *The study concluded that structured educational interventions are effective in improving insulin self-administration knowledge and practices. The findings suggest that continuous education and support for diabetic patients can ensure optimal treatment outcomes and reduce complications related to insulin therapy. Recommendations for future research include long-term follow-up studies, larger sample sizes, and exploration of alternative educational methods to further enhance diabetes management.*
Key Words: STP, WHO, SSA, DCCT

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I. INTRODUCTION:

Insulin is a Wonder Drug do not Deny it those who need it. Diabetes mellitus is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. It is a public health problem as the disease is epidemic in both developed and developing counties. It is recognized as one of the leading causes of premature illness, death, and disability globally4. Its prevalence for all age groups worldwide was estimated to be 2.8% in 2000 and 4.4% in 2030 and projected to rise from 171 million in 2000 to

366 million in 20301. An estimated 14.2 (9.5-29.4) million people aged 20-79 have diabetes in the sub-Saharan Africa (SSA) region, representing a regional prevalence of 2.1-6.7% 3

The World Health Organization has already declared that diabetes has reached epidemic proportions, as number of diabetes patients or prevalence have gone up dramatically over last few decades, from only 30 million in 1985 to 135 million in1995, 177 million in 2000 and more than 200 million by 2010 and World Health Organization (WHO) estimates by current trend that by 2025 the number of diabetes. millions in 1995, 177 million in 2000 and more than 200 million by 2010 and World Health Organization (WHO) estimates by current trend that by 2025 the number of diabetes patients will be more than 300 million. The increase in number of diabetes patients will be mainly in developing countries such as India, China and other highly populated developing countries17. According to Diabetes Control and Complication Trial (DCCT) the strict control of blood sugar level reduces the risks of microangiopathy, retinopathy, and nephropathy in diabetic patients. The treatment should be conducted on an individual basis and requires participation of a multi professional team, commitment of the patient and help from family members 28. Insulin therapy is a complicated technique that cannot be mastered easily by health education once or twice. Even in much practiced patients many faults and misconceptions could creep in. So it is necessary to supervise the existing knowledge and practice level and supplement them with the Structured teaching programme.

II. Material and Methods

The quantitative research design is used to achieve the objectives of the study, this study was a hospital based prospective study and Quasi experimental design was used in this study. This study was carried out on Nursing staffs working in Apollo specialty hospital, Andrapradesh from 22 October 2024 to 22 December 2024. Total enumerative Sampling technique was used in the study A total of 60 staffs were selected for this study, who met the inclusion criteria. The tool used for the study had two sections, one was the demographic details (Age and Gender) and other tool was regarding study variables. The Objectives of the study: This study aimed to assess the effectiveness of a Structured Teaching Programme on the knowledge and practice of insulin self-administration among patients with Diabetes Mellitus at Apollo Speciality Hospitals, Nellore, Andhra Pradesh, Materials and Methods: This hospital based prospective study was conducted in Apollo speciality hospital Andhra Pradesh. variable used dependent variable: Knowledge on diabetes and self -administration of insulin Practice on Self administration of Insulin. Independent variable: was structured teaching programme on self – Administration of insulin Results: A pre-experimental one-group pre-test post-test design was employed, involving 60 diabetic patients using insulin. Data on demographic characteristics, knowledge, and practice of self-administration of insulin were collected using a checklist and questionnaire. Inclusion criteria: - Patients of both the sex (Male & Female), Patients with age limit Above 18 years, Patient who are not suffering from any complication, Patients who were administering insulin by pen, Patients who are not having previous exposure of self-insulin administration Exclusion criteria:- Patients who were apprehensive about self-administration of insulin , Patients who refused to participate in the study The results showed a significant improvement in both knowledge and practice post-intervention. In the pre-test, 41.6% of participants had poor knowledge, 50% had average knowledge, and 8.4% had good knowledge of insulin self-administration. After the STP, 3.4% of participants had average knowledge, 63.3% had good knowledge, and 33.3% had excellent knowledge. In terms of practice, 21.7% of participants had moderate practice, while 78.3% had inadequate practice before the STP. Post-intervention, 13.4% of participants had moderate practice, and 86.6% demonstrated adequate practice in self-administration of insulin. The paired t-test showed a statistically significant difference between pre-test and post-test knowledge scores (Pre-test Mean = 13.5 ± 3.42, Post-test Mean = 27.3 ± 4.02, $t = 25.10$, $p < 0.00001$) and practice scores (Pre-test Mean = 13.4 ± 3.06, Post-test Mean = 20.7 ± 2.09, $t = 12.2$, $p < 0.05$). Conclusion: The study concluded that structured educational interventions are effective in improving insulin self-administration knowledge and practices. The findings suggest that continuous education and support for diabetic patients can ensure optimal treatment outcomes and reduce complications related to insulin therapy. Recommendations for future research include long-term follow-up studies, larger sample sizes, and exploration of alternative educational methods to further enhance diabetes management.

CONCEPTUAL FRAMEWORK

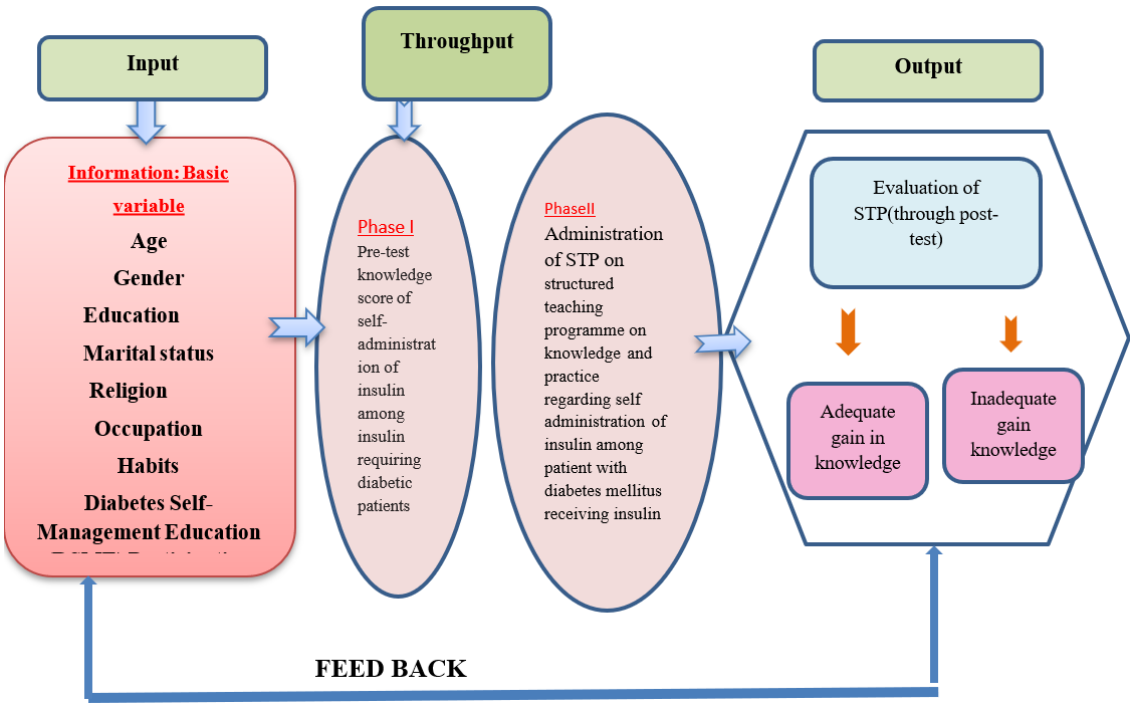

Fig: 1 conceptual framework of open system theory – by bertalanffy & J.W Kenny

Tool

The tool Consists of three sections

Section 1: demographic performa includes 3 items to collect information on the subject's demographic characteristics. It includes age, qualification, years of experience, previous knowledge regarding needle stick injury, and since how they taking insulin (pen and pencil method).

Selection 2: Structured knowledge questionnaire consists of 10 multiple choice questions to assess the level of knowledge regarding self- administration of insulin among insulin requiring diabetic patients before and after structured teaching programme

Percentage	Knowledge Level
(<40)%	Poor
(40-59) %	Average
(60-79) %	Good
(>80)%	Excellent

Section 3: The observation checklist on consists of 21 criteria to assess Practice regarding self-administration of insulin among insulin requiring diabetic patients before and after structured teaching programme The one score is for each correct step and no score is awarded for missed step.

Percentage	Practice level
<50%	Poor
51-79%	Good
>80%	Excellent

III. Results

The collected data was organized, tabulated, and analyzed based on the objectives of the study by using descriptive statistics that are percentage, mean, and standard deviation, and inferential statistics such as chi-square and t-test. The paired 't' test was used to find out the difference in knowledge between pre and post-test and the chi-square test was used to test the association between demographic variables in the Pre & Posttest knowledge score. The findings of the study were presented in the form of tables and figures mentioned in the result.

Section: I Description of subject based on demographic variable. Frequency and percentage distribution based on demographic variables

Table 1: Sociodemographic Profile of study sample, N=60

Sociodemographic variables		**f**	**%**
Age	30-40 years	12	20%
	41-50 years	27	45%
	51-60years	11	18%
	>60years	10	17%
Gender	Male	48	80%
	Female	12	20%
Education	Illiterate	10	17%
	Primary	12	20%
	Secondary	15	25%
	Senior secondary	12	20%
	Graduate and above	11	18%
Marital status	Unmarried	4	7%
	Married	47	78%
	Widow	9	15%
Religion	Hindu	38	63%
	Muslim	9	15%
	Christian	10	17%
	Other	3	5%
Occupation	House maker	15	25%
	Government job	26	43%
	Private job	19	32%
Habits	Veg Vegetarian	11	18%
	Non Vegetarian	49	82%
Diabetes Self-Management Education (DSME) Participation	Yes	8	13.30%
	No	52	86.60%

Table 1: The percentage-wise distribution of staff nurses according to age shows that the highest proportion, 45%, of participants fall in the 41-50 years age group, while the lowest, 17%, are above 60 years of age. A notable majority of the participants are male, comprising 80% of the total group, while females account for only 20%. Regarding marital status, the majority of participants are married, making up 78% of the total. Widows account for 15%, while only 7% of the participants are unmarried, indicating a predominant trend of marriage among the group. In terms of religion, the majority of participants are Hindu, representing 63% of the sample. Muslims make up 15%, Christians account for 17%, and 5% belong to other religious groups, demonstrating that Hinduism is the predominant religion, with smaller representations from other religious communities. The largest proportion of respondents are employed in government jobs (43%, 26 individuals), followed by those in private jobs (32%, 19 individuals), and housemakers (25%, 15 individuals). A significant majority of respondents are non-vegetarian (82%, 49 individuals), while vegetarians account for 18% (11 individuals). Regarding Diabetes Self-Management Education (DSME), only 13.3% (8 individuals) of participants have participated in DSME, while 86.6% (52 individuals) have not engaged in these programs.

Section IIA

To assess the level of knowledge regarding self- administration of insulin among insulin requiring diabetic patients before and after structured teaching programme

Section IIA: Pre-test knowledge score of self- administration of insulin among insulin requiring diabetic patients

N=60

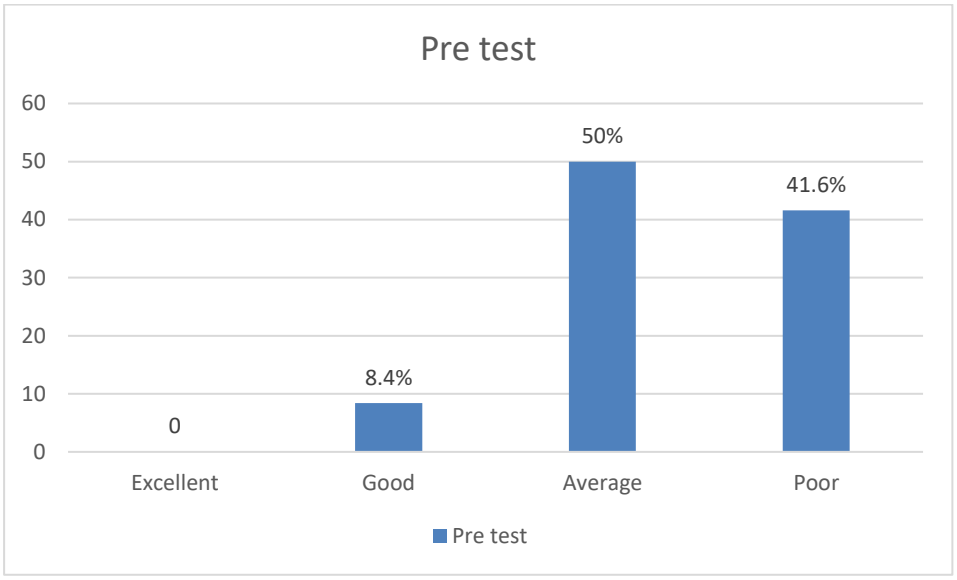

Figure 2: The bar diagram demonstrates the frequency and percentage distribution of knowledge scores among staff nurses before the administration of the teaching program.

Section IIA: Post-test knowledge score of self- administration of insulin among insulin requiring diabetic patients N=60

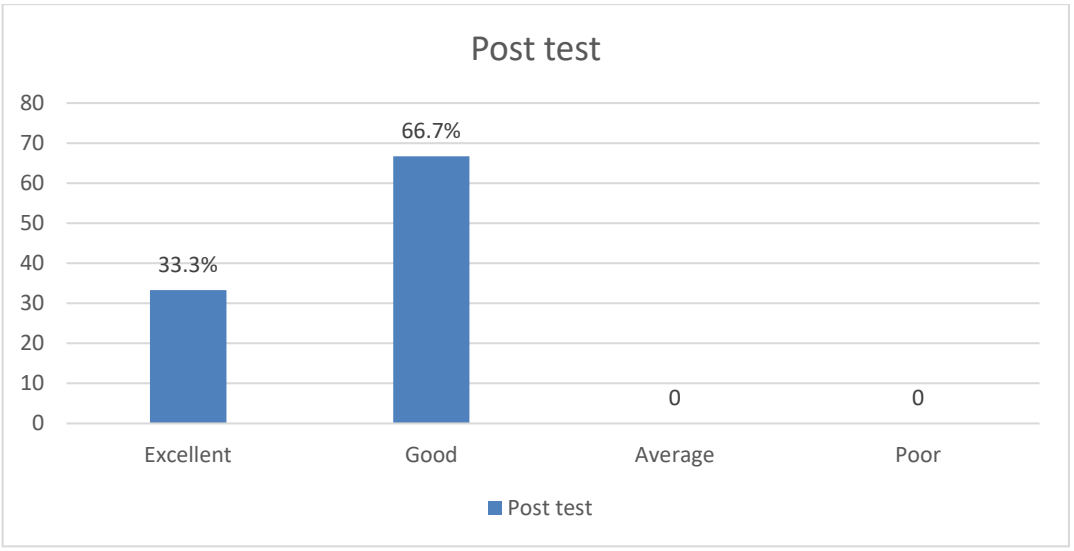

Figure 3: The bar diagram demonstrates the frequency and percentage distribution of knowledge scores among staff nurses after the administration of the teaching program.

Section IIA: Pre and Post-test knowledge score of self- administration of insulin among insulin requiring diabetic patients N=60

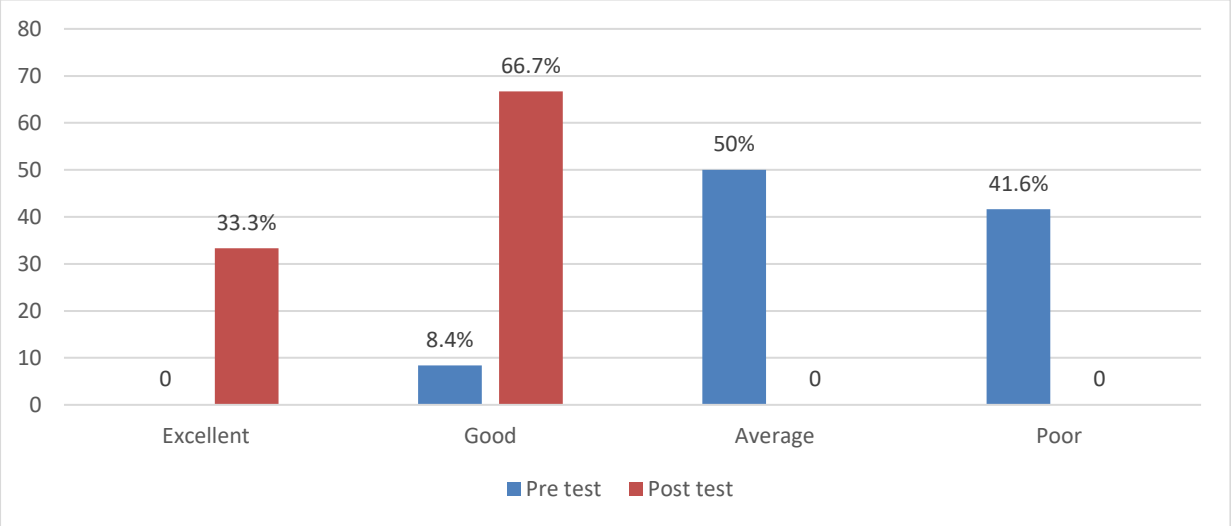

Figure 4 reveals that Pretest 41.6% of patient had poor knowledge, 50% of patients had average knowledge and 8.4% of patient had good knowledge self- administration of insulin among insulin requiring diabetic patients. On the post test 3.4% of patient had average knowledge, 63.3%of patients had Good knowledge and 33.3% of patient had Excellent knowledge self- administration of insulin among insulin requiring diabetic patients.

Section IIB: To assess the Practice regarding self-administration of insulin among insulin requiring diabetic patients before and after structured teaching programme.

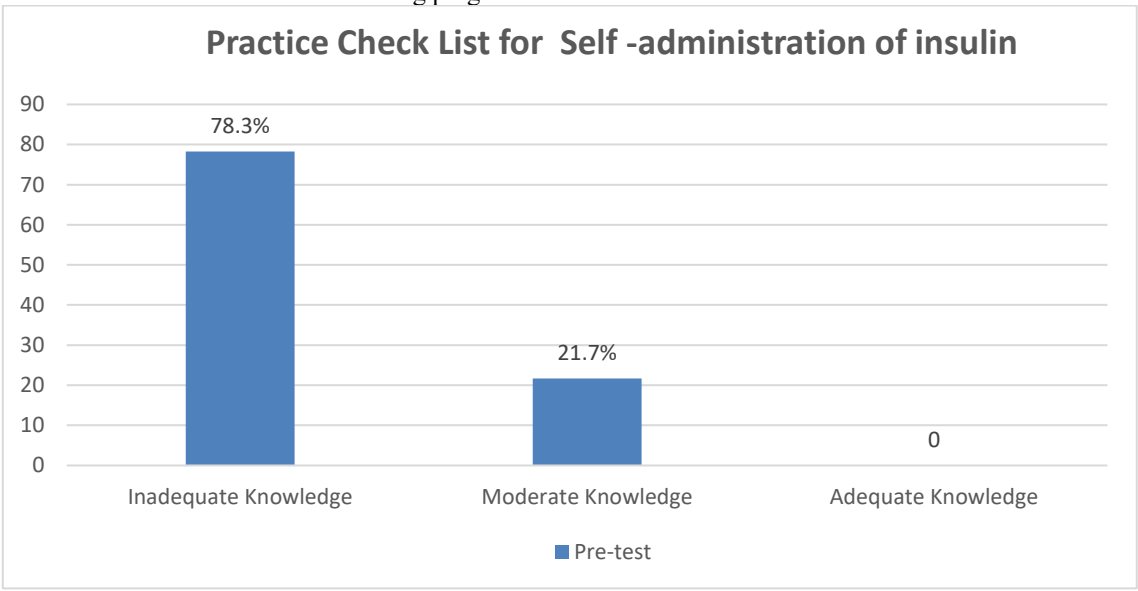

Figure:5 The bar diagram depicts the percentage distribution between pre -test practice scores

Section IIB: To assess the Practice regarding self-administration of insulin among insulin requiring diabetic patients before and after structured teaching programme.

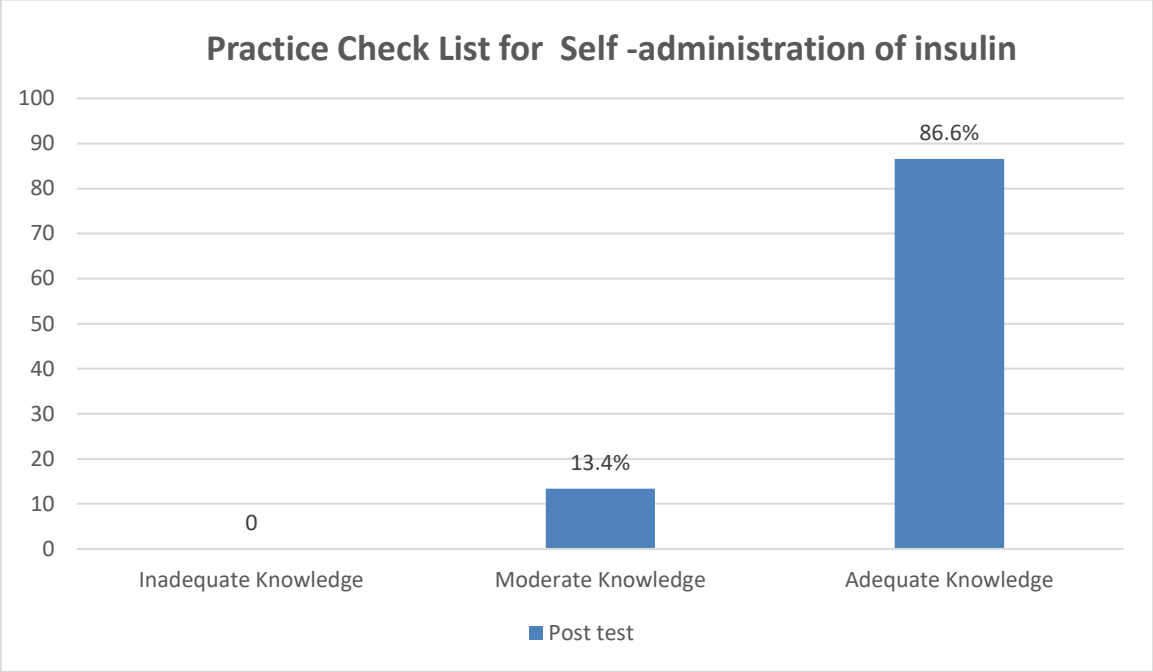

Figure:6 The bar diagram depicts the percentage distribution between post -test practice scores

Section IIB: To assess the Practice regarding self-administration of insulin among insulin requiring diabetic patients before and after structured teaching programme.

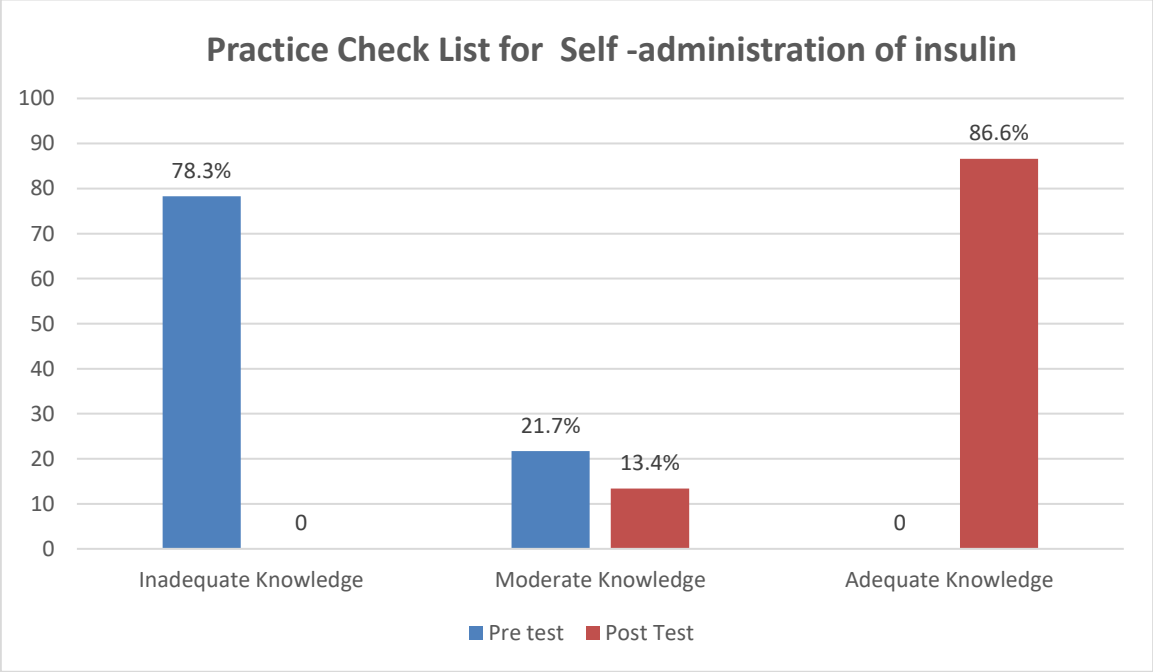

Figure 7 reveals that pre-test 21.7% of patient had moderate knowledge, 78.3% of patients had inadequate knowledge self- administration of insulin among insulin requiring diabetic patients. On the post- test 13.4% of patient had moderate knowledge, 86.6% of patients had adequate knowledge self- administration of insulin among insulin requiring diabetic patients.

Table 2: Mean, Mean difference, SD, and t value of knowledge scores in the target group before and after administration of the teaching program

Table 2: Comparison of pre-test and post-test knowledge score among diabetic patients N=60

Knowledge score about self-administration of Insulin	Pre-test Mean Score	Post-test Mean Score	T statistics
	13.5 ± 3.42	27.3 ± 4.02	t=25.10 df=98 P<0.00001

't'df (39) =1.68, P<0.05 *Significant

As the calculated 't' value is greater than the table value, the research hypothesis is accepted and the null hypothesis is rejected.

Table 3: Mean, Mean difference, SD, and t value of Practice scores in target group before and after administration of Knowledge score about self-administration of Insulin, N=60

Observation	Mean	Mean difference	SD	't'
Pretest – Post Test	13.4	7.3	3.06 2.09	12.2*

't'df(39)=1.68, P<0.05*Significant

As the calculated 't' value is greater than the table value, the research hypothesis is accepted and the null hypothesis is rejected. The teaching p r o g r a m was effective in enhancing knowledge and practice as the mean value of the post-test (10.6) and (13.4) was higher than the pre- test means values (3.06) and (2.09) and the calculated "t" test value [13.4,12.2] of knowledge and practice score was more than the table value [12.2*] at 0.05 level of significance Knowledge score about self-administration of Insulin self-administration of insulin among patient with diabetes mellitus receiving insulin. Paired t test was calculated to analyze the difference in pretest and posttest knowledge scores of self-administration of insulin among patient with diabetes mellitus receiving insulin. Shows the highly significant difference between the pre- test and post-test knowledge score in all areas.

IV. DISCUSSION: -

A highly significant difference was found between the pretest and posttest knowledge score (P<0.05) the computed value 12.2* is greater than the t value 2.09 and it is significant at 0.05 level. So, hypothesis 1 is accepted. The structured teaching Programme is effective to improve the knowledge of self-administration of insulin among patient with diabetes mellitus receiving insulin. The study shows that only age has an association others had no significant association between the pre- test knowledge score of self-administration of insulin among patient with diabetes mellitus receiving insulin. selected demographic variables. self-administration of insulin among patient with diabetes mellitus receiving insulin at Apollo Specialty Hospitals, Nellore. The mean knowledge score in the pretest is 5.2 and the mean knowledge of the post-test is 10.6. The study result shows that structured teaching Programmes are significantly effective in improving the knowledge of Staff Nurses. In our study overall mean knowledge score of 6.3 obtained by the subject in the post-test was higher than the mean pretest score of 13.5.

V. Conclusion: -

The study aimed to assess the knowledge and practice regarding self-administration of insulin among diabetic patients, both before and after the implementation of a structured teaching programme. The findings indicate that the structured teaching programme had a significant impact on improving both the knowledge and practices related to self-administration of insulin. This highlights the importance of structured educational interventions in enhancing the ability of patients to manage their diabetes effectively and independently.

By educating patients about the correct methods of insulin administration, the study also demonstrated the potential to reduce misconceptions and errors in insulin self-administration, which can otherwise lead to poor diabetes control and complications. The increase in knowledge and improved practice following the structured teaching programme suggests that regular education and follow-up are crucial for the successful management of diabetes.

Moreover, the study's outcomes support the need for ongoing supervision and reinforcement of insulin administration skills, particularly for patients with limited prior exposure to insulin therapy. In addition, the findings also emphasize the role of healthcare providers in facilitating better diabetes management through comprehensive education, personalized support, and continuous monitoring.

Recommendations: -

1. **Long-term Follow-up Studies:** Future studies should include long-term follow-up periods to evaluate the sustainability of the knowledge and practices learned through the structured teaching programme. This would help assess whether the improved self-administration techniques are retained over time and translate into better diabetes management and fewer complications.
2. **Larger Sample Size:** A larger and more diverse sample size could provide a more representative understanding of the general diabetic population. This could include a variety of diabetic patients with different demographic backgrounds, allowing for more robust generalization of the findings.

3. **Comparison with Other Teaching Methods:** Future studies could compare the effectiveness of structured teaching programmes with other educational methods such as digital tools, mobile applications, or community-based education programmes. This could provide insights into which educational techniques are most effective in different settings.
4. **Inclusion of Complicated Cases:** Future research should consider including diabetic patients with complications, such as neuropathy, retinopathy, or nephropathy, to understand how these conditions may affect the learning and application of insulin self-administration techniques. This could provide a more comprehensive view of the challenges faced by patients with more advanced stages of diabetes.
5. **Assessing Psychological Factors:** Future studies could also explore the psychological factors influencing insulin administration, such as fear, anxiety, or lack of confidence, which may hinder the successful adoption of insulin self-administration techniques. Addressing these factors in educational programmes could lead to better patient compliance and overall management.
6. **Cultural and Regional Differences:** Conducting studies in different regions or countries with varying cultural practices and healthcare systems may yield interesting insights into how cultural differences influence the adoption of self-management practices for diabetes.

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