Effect of Self Learning Module on Nurses performance regarding caring of Children with Cushing Syndrome.

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Abstract

Background: Cushing syndrome (CS) is a multisystem disease caused by long-term exposure to high levels of glucocorticoids. Slow development, weight gain, truncal obesity, facial plethora, and hypertension are all characteristics. **Aim**: This research aimed to see how a self-learning program affected nurses' productivity when caring for children with Cushing syndrome. **A quasi experimental** approach has been utilized to assess the influence of a self-learning course on nurses' effectiveness in caring for children with Cushing syndrome. **Settings:** This study was conducted in the pediatric and hereditary units of a pediatric hospital associated with Ain Shams University. **Sample:** A practical selection of all nurses working in pediatric and hereditary units (80 bedside male and female nurses) from the starting of January 2021 to the end of June 2021. **Tools of data collection:** To obtain findings for this research, two techniques were used: a standardized interviewing survey form, as well as observational evaluations of nursing care provided to children with CS. **Results:** Nurses' understanding of CS was insufficient during the pre-module phase, although there is a statistically considerable variation between pre and post learning module deployment. Nurses' awareness, practice, and before and post module implementation all have a beneficial relationship. **Conclusion** The nurses evaluated who care for children suffering Cushing syndrome had an inadequate level of knowledge regarding Cushing syndrome, its long-term implications, and long-term continuous therapy. Also, after implementing the module, the studied nurses had a competence practice level in caring for children with Cushing syndrome. **Recommendation:** Enhancing nurses' understanding for value of self-learning modules on the growth of their technical skills as well as the quality of care delivered to children with CS through in-service training activities in various health care institutions.

Keywords: Pediatric Nurse, Cushing's syndrome, Self-Learning Modules& Children.

Introduction:

Cushing syndrome (CS) is a multisystem illness caused by chronic glucocorticoid overdose. Growth has slowed, increase in weight, truncal obesity, facial plethora, and hypertension are all symptoms. Exogenous steroids are most prevalent cause of CS in children. Endogenous causes of CS are uncommon that include pituitary adenoma-induced thyroid hormone excessive production and adrenal cortisol hypersecretion. For management, clinical practice guidelines, including diagnostic algorithms, are available; CS in children may be connected with unique germline and somatic changes. Rapid identification and treatment are critical for reducing severe and long-term illness and mortality **(Yang, Shen and Fuller, 2017)**.

Cushing syndrome, like other endocrine dysfunction, can cause changes in various body functions, based on the adrenocortical hormone associated, such as muscular weakness due to hypokalemia or a muscular wasting due to higher catabolism, buffalo hump is one of the symptoms would include in the Cushing's triad, and these are fat pads over the upper back, moon face is a symptom included in the Cushing's triad, and these are fat pads over the upper **(Lirov & Gauger, 2018).**

Several tests require correction for the children's size; the best screening test for Cushing's syndrome in children is a collection of urine free cortisol (UFC). Cortisol throughout the day: Normally, cortisol levels are quite low around midnight, but with Cushing's disease, the levels are frequently greater than predicted; often, they are not much difference from the early AM cortisol levels **(Singer-Granick et al., 2019)**.

Uncontrolled Cushing syndrome can result in abnormal growth and development, particularly sexual development, high blood pressure, a weakened immune system, diabetes, infertility, heart attack and stroke, blood clots in the legs and lungs, infectious diseases, bone loss and broken bones, unsafe cholesterol levels, depression or other mood changes, memory loss or difficulty focusing, insulin reaction, and prediabetes type 2 diabetes **(Holst etal., 2017)**.

Cushing's syndrome can necessitate ongoing therapy for the rest of child's life. The child's signs, age, general health and degree of the ailment will all influence management. Objective of therapy is to reduce or decline the cause of excess cortisol for children's. Cushing's syndrome therapeutic methods vary due to the many reasons **(Güemes et al., 2016)**.

Treatment that prevent the overproduction of specific hormones. This may be useful for children who have adrenal or pituitary gland problems. If the child has an autoimmune disorder and is on long-term glucocorticoid treatment, the amount and frequency of drug may need to be adjusted. This can prevent the child's body from creating too much cortisol, which causes Cushing's syndrome **(Magiakou et al., 2015)**.

Children with Cushing's disorder will see an endocrinologist every three to six months to check levels of hormones, change medications as required, and assess therapy efficacy. Physicians will request blood and urine tests, as well as physically check the kid, during these sessions. They will determine whether or not the child's height and weight trends have returned to normal, as well as whether or not pubertal development has resumed. Check-ups can be stretched out to every six months once the youngster has stopped growing. If the child had operation, he or she needed to see the surgeon one to two weeks following the procedure and then on an as-needed basis **(Santos et al., 2019)**.

It is commonly known that CS is physiologically, psychologically, and emotionally draining. A prospective investigation of standard of living in children with CS discovered that, although dramatic enhancement from pre-cure to one year after treatment, significant impairment persisted in a variety of quality-of-life metrics. It is vital for the pediatric nurse to assess the kid's maturity level behaviors, identify areas of concern (physically, psychosocially, intellectually, and emotionally), and refer the child to appropriate assistance. To eliminate complications, the nurse must monitor the kid with Cushing's syndrome on a frequent basis **(Keil et al., 2013)**.

Pediatric nurses play an important role in educating affected children, parents, and caregivers about clinical symptoms of adrenal deficiency, pressure dosing with severe illness, trauma, or surgery ("sick day rules"), intramuscular administration of hydrocortisone, and participation with school and other health care suppliers. (For instance, medical alert) Caring for a child or teenager with CS poses challenges such as promoting optimum rise and pubertal development, controlling body form, and promoting psychological health and cognitive maturity. Body composition normalization in children and adolescents following CS treatment is improbable; as a consequence, strategies to enhance diet and fitness regimens must be explored with the child and their family. **(Villoria, M. 2013)**.

Significance of the study:

Cushing's illness is harder to diagnose. Cushing's disease is commonly misdiagnosed because it overlaps with other prevalent medical issues including diabetes, hypertension, overweight, and polycystic ovary disorder. Pediatric nurses should be suspicious of CS in children who have overweight, developmental delay, skin disorders, a history of fractures, or behavioral abnormalities. Although CS is uncommon, it can have long-term negative consequences on the system and brain; hence, early detection and treatment are critical **(Tatsi et al., 2018)**.

There a few researches in Egypt that have focused on Cushing syndrome as it relates to pediatric nursing care. As a result, the current study was undertaken to assess the influence of an educational module on nurses' competence in caring for Cushing syndrome on the designated module outcomes among their children. Hopefully, the findings will provide a standard of care that may be followed to enhance pediatrics nurses' knowledge and skills and create better outcomes for children. Furthermore, this promotes children's bio - psychosocial well-being

while also offering guidelines and suggestions that should be represented in pediatrics nursing education and providing evidence-based material that can be used to advance nursing process and research within the field of pediatrics nursing.

Aim of the study:

The purpose of this evaluate was to see how a self-learning curriculum affected nurses' productivity when caring for children with Cushing syndrome.

This aim was achieved through:

• Evaluating nurses' awareness and competence in caring for children with Cushing Syndrome.

• Designing and implementing self-learning module for studied nurses regarding children suffering from Cushing Syndrome.

• Evaluating the effect self-learning module on nurses' knowledge and performance regarding children suffering from Cushing Syndrome.

Research hypothesis:
H1: Nurses who received the self-learning program had a higher mean total score of knowledge about caring for children with Cushing syndrome than previously.
H2: Nurses who acquire the self-learning module will have a greater mean practice result than previously.

Subjects and Methods:

Technical Design:

It contained research design, setting, subjects, and information gathering instruments.

Research Design:

This investigation was carried out using a quasi-experimental design.

Research Setting:

The research was carried out in a pediatric hospital connected with Ain Shams University's pediatric unit and heredity unit.

Research Subjects:

A selected sample includes all (80) of the nurses functioning in the earlier indicated context.

Tools of data collection:

The following instruments were used to obtain information:

1. Pre-designed questionnaire: (pre/post module):

The investigator created it after researching related material and writing it in plain Arabic. It is divided into three sections to evaluate the preceding facts.

Part I: Socio demographic characteristics of nurses: It is focused with the following nursing features: age, gender, and years of experience, educational level, qualification, and training courses.

Children with Cushing Syndrome have features such as age, gender, and medical history.

Part II: Nurses' Knowledge about Cushing Syndrome such as: definition, causes, signs & symptoms, investigation, complications, risk signs of acute stage.

Scoring system for knowledge questions: The right answers were scored one, and those wrong were scored zero.

Scoring system:
- Score from 0 <60 referred to poor knowledge.
- Score from 60 <75 referred to average knowledge.
- Score from 75 ≤ 100 referred to good knowledge.

Part III: Observational checklist: Designed Observational Checklist adopted from **(Salah** 2002), It was performed to evaluate the nurses' practice in caring for children with Cushing Syndrome. The done step was scored one or two score according to its weight, and the other not done or incorrect done step was scored zero, then total score was classified as:

Scoring system:
- Score from 0 <85 referred to incompetent performance.
- Score from 85 ≤ 100 referred to competent performance.

Validity and Reliability:
It was determined by a panel of five pediatric professionals from the nursing and medical fields. Their feedback was solicited on the format,

layout, consistency, correctness, and relevance of the tools. Cronbach alpha was used to test the reliability of the translated version of the questionnaire, and the result was 0.788.

Operational Design:

It consisted of preparatory phase, ethical considerations, pilot study and fieldwork.

Preparatory Phase:

This step involves doing a literature review on nurses' knowledge of Cushing Syndrome. This helps with the creation and selection of sample collection tools for the inquiry. Throughout this stage, the investigators additionally went to the selected location to get to know the members and the investigation environment.

Ethical Considerations:

Nurses granted informed permission prior to data gathering. They were told regarding the research's objective and predicted findings, and they were notified that the investigation is risk-free, that their involvement is entirely optional, and that they have the choice to resign from the experiment during any period for any excuse. They were additionally assured that their identities and confidentially will be protected, and that the information acquired would be used purely for study reasons. All aspects of ethics, morals, culture, and religious views were respected.

Pilot study:

To examine the suitability and practicability of the investigation techniques, a pilot investigation was performed with 10% of the nurses investigated (8 nurses). The outcomes of the pilot study were used to make modifications. Considering some phrases had been restated, Nurses who participated in the pilot trial were excluded from the primary research sample. The final form of the items, including the time necessary to create each tool, was then acquired.

Fieldwork:

From the start of January 2021 until the end of June 2021, the practical fieldwork lasted 5 months. The investigators were on-site three days a week, in the morning and afternoon shifts, and the actual fieldwork was split into four parts.

Assessment phase: (one month)

Throughout this period, the investigators employed the developed instruments to gather information on nurses' knowledge and productivity in connection to children with Cushing Syndrome (pre-test) in their jobs. Before commencing interviews and data collection, the researchers explained the study's purpose and expectations to the nurses being studied. A pre-designed survey was filled out by the nurses. The time it took to fill the survey was decided by the nurses' own knowledge; the estimated time was 15-20 minutes. The researchers performed the observational checklist while giving treatment to children with Cushing Syndrome at the nurses' workplace. The time taken dictated the time necessary to accomplish the questionnaire; each technique duration was between 10 and 15 minutes.

Planning phase: (one month): The pre-assessment data was examined to determine the nurses' training needs, and the educational module was produced in Arabic by the researchers in light of the literature evaluation. It was rewritten, categorized, and the substance of the guidelines was developed to meet the educational demands of nurses. It included the description of Cushing Syndrome, the variables that contribute to its severity, urgent treatment, management, investigation, the role of the nurse, and discharge instructions. Nursing care management of children suffering from Cushing Syndrome was one of the educational module's practical parts.

Implementation phase: (two months): The self-learning module was implemented over the course of eight weeks, three days each week. The researchers examined the nurse schedule to determine the number of nurses on each shift. The nurses that were studied were separated into eight groups, with each group consisting of ten nurses. The teaching module was used in eight (6-hour) sessions for each group (2 sessions for theory&4 sessions for practice). Each session lasted between 45 and 60 minutes. To begin, the investigators addressed the theoretical components of the Cushing Syndrome self-learning module through group interaction with the researched nurses. Various instructional methods, like as group conversation, demonstration, and re-demonstration, were used. The right media for the situation was employed.

Evaluation phase: (one month)

The exact instruments have been utilized as an indicator to measure the amount of progress for all examined nurses immediately following the installation of the self-learning module.

Administrative Design:

A statement delivered by the Dean of the Faculty of Nursing, Ain Shams University, to the medical and nursing directors of the previously specified research setting to get their approval to run the investigation acquired formal authority to run the research. The title, purpose, and predicted results of the research were all specified in the letter.

Statistical Design:

Using the number and percentage distribution, the acquired data was arranged, updated, scored, tallied, and evaluated. The Statistical Package for Social Sciences (SPSS) version 18 was used for statistical analysis. The Chi-square (X2) test was used to compare qualitative variables, while the Pearson correlation coefficient was used to analyses quantitative variables (r). The following factors were considered while determining the importance of the findings: When p>0.05, the difference is statistically inconsequential; when p0.05 or p0.001, the difference is statistically important.

Results:

Table (1) Clarifies That majority of nurses were between the ages of 20 and 30, with an average age of 26, 96 + 5,561 years. The vast majority of them (88.8%) were women, and 75% had a nursing high school diploma. Furthermore, 80.0 % of them had less than 10 years of experience, and none had participated in metabolic illness education training.

Figure (1) According to this number, approximately one-third (32.7%) of the children investigated were under the age of one year. However, most of the youngsters questioned (20%) were between the ages of 5 and 10.

Figure (2) shows that more than two-thirds (67.3%) of the investigated children were boys.

Table (2) Shows the percentage distribution of the examined nurses' Cushing syndrome knowledge pre and post the self-learning program was implemented. It shows that there was a high level of statistical significance both pre and post the self-learning module was implemented (p value = 0.00**).

Table (3) which shows the number and percentage analysis of the researched nurses' practice regarding overall findings for children

with Cushing syndrome prior to the actual educational module, reveals that there were extremely numerically significant pre and post-self-learning self-learning module implementation (p value was 0.00**), as well as statistically significant regarding ensuring that skin was preserved clean and dry and dipper modifications were made on a regular basis (p - value was 0.00**). (The 0.05 p-value indicates that the result is significant).

Table (4) shows that The number and percentage distribution of the studied nurses' practices regarding intake and output chart measuring and physiological parameters for children with Cushing syndrome pre and post-self-learning module demonstrates that there were statistically significant differences between before and after the educational module was applied (p-value was 0.05).

Table (5) explains that the number and percentage distribution of the studied nurses' practices concerning nutrition and medication for children with Cushing Syndrome before and after educational module implementation confirms that there were extremely numerically considerable pre and post educational module implementation, but statistically significant considering monitoring relating sheets of diet for guidelines (p- value was 0.0).

Table (6) The percentage distribution of the investigated nurses' practice regarding continuous education for parents and their children with Cushing Syndrome pre and post-educational module reveals numerically important differences considering Regimens that are doing well or don't, plan of discharge, and aftercare (p value was 0.05).

Table (7) the number and percentage distribution of the researched nurses' Overall knowledge and total practice considering Cushing Syndrome demonstrates that, prior to the intervention of the educational module; The majority of nurses (88.8 and 87.5%) have insufficient knowledge and in competence practice when it comes to managing children with Cushing Syndrome. In contrast, after the instructional module was introduced, the majority of nurses (96.25 percent and 88.8 per cent, respectively) had Sufficient knowledge and Competence practice.

Table (8) following the implementation of the teaching module, a correlation has been established among both nurses' information and practice and their demographic characteristics. This table demonstrates a numerically considerable positive relationship between entire nurses' knowledge and practice score (0.481, p0.00).

Table (1): Total number and percentage distribution of the studied nurses according to their Personalcharacteristics (n=80)

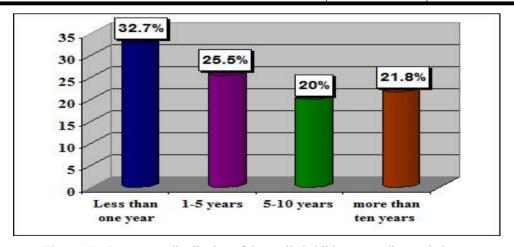| Sociodemographic Data	Study sample N=80	
	No	**%**
Age of years		
• 20 - < 30	54	67,50
• 30 - < 40	25	31,2
• ≥ 40	1	1,3
X ±SD: 26.96 ± 5.561		
Sex :		
• Male	9	11.2
• Female	71	88.80
Educational level		
• Diploma	62	77.50
• Technical	7	8.80
• Bachelor degree in nursing	11	13.80
Years of experience		
• <1year	0	0.0
• 1 - < 10 years	64	80.00
• ≥ 10 years	16	20.00
X±SD= 6.76 ±4.77		
Attending previous training courses regarding Cushing Syndrome		
• Yes	0	00.0
• No	80	100,0

Figure (1): Percentage distribution of the studied children according to their age
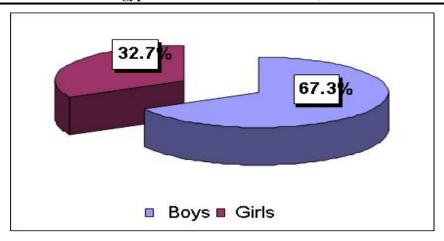
Figure (2): Distribution of the studied children according to their gender

Table (2): Total Number of Examined Nurses and their Percentage Distribution Based on their Knowledge of Cushing syndrome Before and After Implementing the Teaching Module (N=80).

knowledge about Cushing syndrome	Pre module implementation (80)		Post module plementation (80)		X2	P value
	No	%	No	%		
Explanation						
• true	18	22.50	68	85.00	62.85	0.000**
• un true	62	77.50	12	15.00		
Causes						
• true	32	40.00	54	67.5	12.16	0.000**
• un true	48	60.00	26	32.5		
Signs and Symptoms						
• true	19	23.80	65	81.3	53.03	0.000**
• un true	61	76.30	15	18.8		
Types						
• true	7	8.80	63	78.8	79. 64	0.000**
• un true	73	91.30	17	21.3		
Acute stage dangers						
• true	32	40.00	67	83.8	32.45	0.000**
• un true	48	60.00	13	16.3		
Complications						
• true	18	22.50	64	80.00	52.93	0.000**
• un true	62	77.50	16	20.00		
Diet avoidance						
• true	28	35.00	59	73.8	24.21	0.000**
• un true	52	65.00	21	26.3		
Medical therapy						
• true	32	40.00	53	66.3	11.06	0.000**
• un true	48	60.00	27	17.6		
Preventive approaches						
• true	26	32.5	60	75.0	29.06	0.000**
• un true	54	67.5	20	25.0		

(P≤0.05) Indicates A statistical significance difference

Table (3): Number and Percent of Nurses in the Research who Performed General Observations on Children with Cushing syndrome pre and post the Educational Module was Implemented (N=80).

General Observations	Pre module implementation (80)		Post module implementation (80)		X2	P value
	No	%	No	%		
A- Peripheral perfusion and skin colour assessment					79.25	0. 00**
• performed	0	0.00	54	67.50		
• Not performed	80	100	26	32.50		
B- Determine whether the skin is intact, dry, or damaged (particularly the skinfolds)						
• performed	80	100	61	76.30	81.50	0.00*
• Not performed	0	0.00	19	23.80		
C- Keep skin clean and dry, and change diapers frequently.						
• performed	14	17.5	73	91.30	87.69	0.05
• Not performed	66	82.5	7	8.80		
D- Measuring Height and Weight						
performed	0	0.00	60	75.0	96.00	0.00*
Not performed	80	10	20	25.0		
E- Measuring Body Mass Index						
• performed	12	15.00	55	68.80	47.47	0. 00**
• Not performed	68	85.00	25	31.30		

(P≤0.05) Indicates A statistically Significant difference

Table (4): Number and percentage of nurses in the research who practiced neurological condition and physiological responses for children with Cushing syndrome before and after the educational module was implemented (N=80).

physiological responses for children with Cushing syndrome	Pre module Intervention (80)		Post module Intervention (80)		X2	P value
	No	%	No	%		
Assess Intake & output					109.47	0.00*
• Performed	0	0.00	65	81.30		
• Not performed	80	100	15	18.80		
Urine examination						
• Performed	24	30.00	60	75.00	32.43	0.00*
• Not performed	56	70.00	20	25.00		
Physiological response						
• Performed	15	18.8	58	72.50	46.58	0.00*
• Not performed	65	81.30	22	27.50		
Blood glucose level test						
• Performed	25	31.3	64	80.00	38.51	0.05
• Not performed	55	68.8	16	20.00		

Blood sampling						0.00*
• Performed		56.30	67	83.80	14.40	
• Not performed		43.80	13	16.30		

(P≤0.05) Indicates A statistically Significant Difference.

Table (5): Number and percent of nurses in the study who practiced nutrition and medicine for children having Cushing syndrome pre and post educational module implementation (N=80).

Items	Pre module implementation (80)		Post module implementation (80)		X2	P value
	No	%	No	%		
Nutrition and medication A- Nutrition and diet system					60.67	0.00**
• Performed	2	31.30	66	82.5		
• Not performed	55	68.80	14	17.5		
B- Continue usual method of feeding						
• Performed	26	32.5	75	93.80	30.86	0.00**
• Not performed	57	67.50	5	6.30		
C- review sheets of diet						
• Performed	17	21.30	63	78.8	86.03	0.05
• Not performed	63	78.8	17	21.30		
Medications Administration:						
• Performed	41	51.30	57	71.30	13.29	0.00**
• Not performed	39	48.80	23	28.80		

(P≤0.05) Indicates A statistically Significant Difference.

Table (6): Pre and post-self-learning module installation, the number and percentage distribution of the examined nurses according to their practice related continuous education for parents and their children with Cushing Syndrome (N=80).

Items	Pre module implementation (80)		Post module implementation (80)		X2	P Value
	No	%	No	%		
Continuous education					24.21	<0.05
• Performed	28	35.00	71	88.70		
• Not Performed	52	65.00	9	11.30		
Regimens that are doing well or don't						
• Performed	18	22.50	61	76.30	71.12	0.05
• Not Performed	62	77.50	19	23.80		
Plan of discharge						
• Performed	26	32.5	75	93.80	30.86	0.05
• Not Performed	57	67.50	5	6.30		
Follow up						
• Performed	17	21.30	63	78.8	86.03	0.05

• Not Performed	63	78.8	17	21.30		

(P≤0.05) Indicates A statistically Significant Difference.

Table (7): Distribution of Percentage for researched nurses' overall knowledge and total practice regarding Cushing Syndrome (N=80)

Items	Before module implementation (80)		After module plementation (80)		X2	P value
	No	%	No	%		
Overall knowledge					120.04	0.00**
• Sufficient	9	11.20	77	96.25		
• insufficient	71	88.80	3	3.75		
Total practice						
• Competence	10	12.5	71	88.80	55.12	0.00**
• In competence	70	87.5	9	11.30		

(P≤0.05) Indicates A statistically Significant Difference.

Table (8): Correlation among overall nurses' Cushing Syndrome knowledge, actual practice, and demographic characteristics (N = 80).

Items	overall knowledge	
	r	P Value
- overall practice	0.481	0.00*
- Nurses age	0.004	0.959
- Academic credentials	0.039	0.629
- sex	0.017	0.834

Discussion:

Cushing syndrome study is scarce in Egypt, particularly among nurses, and there have been few studies on families that have children suffering from Cushing syndrome, despite the fact that it is considered a crisis for the kid and their family to learn that their children are suffering with CS. Cushing's disease is uncommon in children, and its clinical manifestations not the same those seen in adults. Growth retardation may be one of the first and most noticeable symptoms of Cushing's illness in children. Obesity-related moon face, buffalo hump, bruises, hirsutism, hypertension, and psychiatric disorders are other typical appearances.

In terms of personal and professional sociodemographic characteristics of nurses, the current study's findings show Most of the nurses were between the age groups of 20 and 30, with an average age of 26, 96 + 5,561 years. The vast majority (88.8%) were women, with 77.5 % holding a nursing diploma. In addition, 80.0% had fewer than 10 years of working experience.,

and none of them had attended training courses on metabolic diseases and nursing care of children with CS. These findings necessitate insights and actions from Egyptian nursing authorities to promote and expand in-service continuing education programs for nurses in all sectors, which has a favorable impact on child health. Female nurses, on the other hand, were the primary cares for **(Liu et al. 2017)** and **Güemes et al. 2016)** who stated that female nurses were the most caregivers. This could be explained as the nurses of children are considered the most primary health care providers around the world, they take on enormous responsibilities in providing care.

Based on the current study, the nurse is a crucial part of the health care team in the identification, evaluation, treatment, and follow-up of children with CS. This includes collecting exact growth measures, charting them, assisting with correct specimen collection, and analyzing the appropriate use of "sick day recommendations." It also plays a vital role in giving aid and education **(Koracevic et al., 2020).**

Regarding to the findings of the current study, the vast majority of nurses (88.8 %& 87.5%) had inadequate knowledge and performance in caring for children with Cushing syndrome prior to the deployment of the self-learning module. In contrast, after implementing the self-learning module, a reasonably high percentage of nurses (96.25 % & 88.8 %) had sufficient level knowledge and competent practice, respectively. These findings highlight the nurses' need for excellent self-educational programs on the optimal treatment of children with Cushing syndrome **(Julia E Barillas,et al., 2018).**

The current study demonstrates that more than half of the nurses had a competent practice level in terms of their nursing practices and caring function. These findings might be linked to the disease's nature; it is one of the most difficult chronic diseases. It is a significant burden on people, families, and communities. Simply put, it limits the patient, particularly the patient's family, due to a lack of awareness about the condition, poverty, limited access to health care, and inadequate follow-up, as indicated by the nurses in the current study. These findings are consistent with the findings of **(Parksook, Laichuthai, &**

Sunthornyothin2020). and **Rubinstein et al. 2020)** who discovered that smaller percentages of nurses met appropriate practice standards for children with Cushing syndrome The intervention, according to the researchers, refreshes participants' knowledge. The current study shows a link between nurses' knowledge, practice, and demographic features after using a self-learning module. There was a statistically significant relationship between total nurses' knowledge and practice score (0.481, p 0.00).

Conclusion:

The current study concluded that the developed self-learning program is beneficial in boosting upgrade and nurses' knowledge and performance in caring for children with Cushing syndrome. However, there was a significant statistical relation between nurse knowledge and practice evaluations. Furthermore, after the establishment of an educational module, there was a highly statistically significant link between nurses' knowledge and practice rates and their age and credentials.

Recommendations:

The following suggestions were made depending on the findings of the current investigation:

- Enhancing nurses' understanding of the value of self-learning modules on the growth of their technical skills as well as the quality of patient care delivered to children with CS through in-service training activities in various health care institutions.

- Further development of self -learning module for other pediatric nursing health problems focusing on the nurses practical skills is mandatory.

- Regular assessment and monitoring of factors hindering compliance of children with Cushing syndrome and their families during follow up.

- Continuous nurses' evaluation and monitoring their knowledge and practice for the children with Cushing syndrome.

- Frequent education and training courses on CS should be offered for nurses to guarantee enough understanding and effective practice.

- For directing nurses' practice, printed universal regulations and short handouts on CS should be accessible.

- The outcomes can be generalized by repeating the study on additional hospitals with a larger sample size.

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