Original Research Article

Nurse-Led Educational Program on Practice of Asthma Management Using Global Initiative for Asthma Guideline

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Abstract

The pivotal and nodal role of nurses in the healthcare industry is very vital for the proper management of asthma. To effectively intervene, nurses must be skillful in techniques used in asthma management which must be evidenced-based. The study objective is to use educational program to enhance nurses' asthma management practice. This study adopted Quasi-experimental one group pre-post research design. Two government teaching hospitals in Rivers State were used in this study. A total number of 52 nurses were purposively selected in collaboration with nurse-leaders in each study setting. Checklist developed by the researcher and experts in the field of medical surgical nursing using modified Delphi method was used to collect data based on GINA guidelines pre- and post-educational program. Reliability test for the checklist using Cronbach's alpha co-efficient yielded .89. Educational program was administered for six days respectively at the two study settings. Data collected were analysed using descriptive and inferential statistics (paired t-test) at level of 0.05 level of significance. Participants with good asthma management practice at pre-educational program were 36.5% while at post-educational was 80.8%. Paired-simple t-test analysis on the difference in asthma management practice before and after nurse led educational program using GINA guideline indicates that $t_{cal} = 51.23$, df = 51, and $t_{tab} = 1.96$ Since $t_{cal} > t_{tab}$ at $P < 0.05$, Hence, the null hypotheses was rejected. The study concluded that nurse-led educational program using adopted GINA guidelines enhanced practice of asthma management among nurses.
Keywords: Asthma, management practice, nurses, nurse-led, Global initiative for asthma guideline.

INTRODUCTION

The pivotal and nodal role of nurses in the healthcare industry is very vital for the proper management of asthma. It is the duty of the nurse to properly educate patients on asthma symptom recognition, environmental control, asthma management and preventive measures and also administer evidence-based asthma treatment for positive patient outcome. To effectively intervene, nurses must be skillful in techniques used in asthma management which must be evidenced-based.

Asthma is a lung disorder characterized by airway hypersensitivity to different stimuli that result in airway inflammation, constriction of airway muscles (tighten) which results in airway obstruction and bronchospasm. Asthma affects more than a quarter of a billion people worldwide, it is responsible for over 1000 deaths a day of which the majority are preventable (Levi *et al*., 2022). In Canada it affects 10% of the population (Public Health Agency of Canada, 2020). It is estimated that 25 million people are living with asthma in the United States, which equates to one in every thirteen persons. Asthma data in Nigeria is inconsistent as there is no national representative data on asthma (Federal Ministry of Health, (FMH 2022). However, it is estimated that approximately 13million (10.7%) Nigerians are living with asthma (Ozoh *et al*., 2019). Centre for Disease control, (CDC 2022) states that adult asthma has immense economic impact, as approximately $50.3 billion is lost in medical care, estimated $3 billion productivity lost and $29 billion spent on asthma related mortality. Global burden of asthma, estimates that 21.6 million persons has adjusted life style yearly due to asthma, and asthma is ranked 34th among the leading causes of burden of disease and 24th in the leading causes of Year lived with disability (The Global Asthma Report, 2022). Asthma occurs more among the black, asthma related death occurs among adult more than any other age group

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In order to manage asthma proper, asthma education is an essential tool. Patient asthma education is part of nurses' asthma management strategy, for nurses to have adequate asthma knowledge that will enhance their management practice, there is need for continuous asthma education using current evidenced-based guidelines. Guilbert, Bacharier, & Fitzpatrick, (2014) emphasized the importance of using evidence-based guideline in nursing educational programs to enhance practice. It is important that current evidence -based guideline is used for any form of asthma education as asthma evolves each year. In view of the above, clinical guidelines are designed to ensure evidence-based research are assimilated in clinical practice. In asthma management, many clinical tools have been developed over the years to ensure evidence-based knowledge and management practices of asthma in different countries, however World Health organization (WHO) recommended Global initiative for asthma (GINA) guidelines as global guideline for asthma management. GINA guidelines were established in collaboration with the National Heart, Lung and Blood Institute (NHLBI) and the World Health Organization (WHO) in 1993 to improve asthma awareness, prevention, and management practices worldwide (Reddel *et al.*, 2015). GINA provides clinicians with an annually updated evidence-based strategy for asthma management and prevention, which can be adapted for local context. It is evidence-based and clinically oriented, and relevant to both low and high resources countries.

To ensure proper asthma management, Nigeria adopted the Global Initiative for Asthma (GINA) guidelines as its standard for asthma care (Ayuk *et al.*, 2017). Despite adoption and implementation of GINA guideline there is still discrepancies in asthma management practices among nurses. The American Academy of Allergy, Asthma, and Immunology, AAAAI (2018), stated that while guidelines are becoming more evidence-based, there is minimal impact on improving asthma outcome due to a lack of understanding and application of the guideline in the management of asthma by healthcare providers. Though literature reviewed that most nurses have basic knowledge of asthma and management practice, there is need for all nurses to be at same pace with their knowledge and practice of asthma management based on evidence-base guideline. If asthma guidelines are not well understood and utilized by health workers, it leads to poor knowledge and management practices. AAAAI (2018) stated that poor understanding of asthma guideline leads to asthma flare-ups, emergency visits, exacerbation, morbidity, mortality etc. However, when there is proper understanding of asthma guideline number of emergency visits, flare-ups and exacerbations will reduce drastically.

NHLBI (2018) strongly recommend the Provider Asthma Care Program (PACE), which is an interactive educational program to improve providers awareness of existing asthma management guideline. A study by Moscatelli (2020) on improving care of asthma patient through staff education concluded that the program increased knowledge and management practices of nurses that participated in the educational program. Axelson *et al.*, (2020) in their study also concluded that comparisons between pre intervention and post intervention shows that the educational program strengthened the healthcare professionals' management practices. Though there are no published studies on nurses using GINA guidelines to guide educational programs to improve practice of asthma management, nurses in the past have used guideline guided educational programs to improve care for other health conditions such as diabetes, wound care, hypertension etc, such studies improved asthma management practice (Pérez-Fuentes, 2019). Other healthcare practitioners have also improved asthma care through educational program using GINA guidelines in Nigeria (Ozoh, 2022; Ayuk, 2017; Anyatonwu, 2020). The use of evidence-based guidelines to guide educational programs is still not well practiced among nurses especially in asthma management, there is need for nurses to embrace this concept for proper patient care (C. Chukwu, personal communication, February 4, 2023). Hence, the need to educate nurses in Rivers State on the most recent evidence-based asthma management strategy using adopted GINA Guideline in other to close asthma management gap.

1.2 Statement of the problem

Despite commendable efforts to improve asthma care over the last two decades, many patients have not benefited from advancements in asthma management and frequently lack even the most basic of care such as proper inhaler technique as GINA (2022) stated that 80% of asthma exacerbation is as a result of poor inhaler technique. Uncontrolled asthma and ineffective management remain a public health challenge in the developing countries. Asthma is generally under-diagnosed and under- treated and this has resulted in significant burden of disease, as nurses and other healthcare practitioners continues to manage asthma poorly despite implementation of adopted asthma guidelines by various institutions.

Although the revolutionary changes are noticed in the medical and technological advancements, still there is poor asthma management among nurses, this could be attributed to non-adherence to evidence- base treatment guideline. This implies that most nurses do not have the requisite knowledge and skills that will enhance their asthma management practice. Nurses are important partners in the provision of quality healthcare to persons living with asthma worldwide. However adequate attention has not been given to asthma education among nurses. This has resulted in poor management of asthma. In view of the above, WHO theme for world Asthma Day 2022 was Closing Gaps in Asthma Care (FMH, 2022), this was in the bid to close asthma management gap as there is still wide gap between what is stipulated in

asthma evidence- base guidelines and actual practice especially in low economic countries such as Nigeria.

Studies shows that continuing educational and training on asthma care can increase nurses' asthma knowledge and management practice (McCabe *et al.*, 2019). The AAAAI suggested that educational programs be developed to ensure the continuous education of nurses and other healthcare workers on skills in asthma management practices using current recommended evidence-based guidelines. Ghaleb (2021) opined that an interactive educational program using evidence-based guideline will increase nurses and other healthcare workers asthma knowledge and management practices. Tahira (2022), concluded that there was statistically improvement on asthma knowledge and management practice. Elkamil *et al*., (2016), conducted a cross sectional study titled Assessment of nurses' knowledge and practice regarding care of asthma patients. Azizz (2018) also conducted a cross sectional study titled Nurses' Knowledge about Asthmatic Attacks.

Asthma is a public health issue in Niger Delta region in Nigeria, especially Rivers State due to side effect of oil exploitation. There is need for educational program for nurses using evidence- based guidelines in Rivers State as nurses are frontline health workers and they play pivotal and nodal role to ensure asthma patients receives optimal care, their understanding of asthma guideline will enhance asthma management gap. Provider Asthma Care program recommended by NHLBI, which is an interactive educational program for providers to improve awareness of existing asthma management guidelines should be encouraged. Hence the need for this study tilted a nurse-led educational program on knowledge and practice of asthma management using Global initiative for asthma in Rivers State Teaching Hospitals.

1.3 Objective of the study
The main objective of this study is to enhance practice gap through educational program for nurses on practice of asthma management using GINA guidelines.

Specific Objectives are to:
1. Assess nurses baseline practice of asthma management pre- nurse led educational program using GINA guidelines in Rivers State Teaching Hospitals.
2. Assess nurses self- reported practice of asthma management in rivers state university teaching hospitals
3. Assess nurses practice of asthma management post- educational program using GINA guideline in Rivers State University Teaching Hospitals
4. Find out the difference in nurses' practice of asthma management pre and post nurse led educational program using GINA guideline in Rivers State Teaching Hospitals

1.4 Research questions
1. What is the nurses baseline practice of asthma management pre- nurse led educational program using GINA guidelines in Rivers State Teaching Hospitals.
2. What is the nurses self- reported practice of asthma management in Rivers State university teaching hospitals
3. What is nurses practice of asthma management post- educational program using GINA guideline in Rivers State University Teaching Hospitals
4. What is the difference in nurses' practice of asthma management pre and post nurse led educational program using GINA guideline in Rivers State Teaching Hospitals

1.5 Research Hypotheses
Ho: There is no significant difference in nurses' practice asthma management before and after nurse led educational program using GINA guideline in Rivers State Teaching Hospitals

Scope of the study
Fifty-two (52) nurses who were purposively selected participated in this study. The participants for this study were drawn from nurses of different ranks and years of experience from female medical ward, male medical ward and Accident and Emergency units of the two government teaching hospitals in Rivers State: University of Port Harcourt Teaching Hospital and Rivers State University Teaching Hospital. The study covered every area of adult asthma care by exploring the concept of knowledge and asthma management practices. It reviewed asthma diagnosis, severity classification, pharmacological and non - pharmacological asthma management, step wise approach in asthma management, personalized action plan, comorbidity in asthma, asthma control, techniques in asthma management etc. The study was guided by transformative learning theory. The scope of this study is limited to nurses taking care of adults living with asthma in the two Government teaching Hospitals in Rivers State.

LITERATURE REVIEW
Asthma is a complex chronic inflammatory syndrome characterized by obstruction of airflow in the airway, airway hyper reactivity to nonspecific stimuli and exacerbation episodes of airway obstruction causing respiratory symptoms (Gupta, 2018). Individuals with asthma typically react to concentrations of agents too low to cause symptoms in people without asthma (Ranti, 2021).

The exact cause of asthma is not known but it is often link to genetic factors, childhood illness, and exposure to allergy. Asthma is believed to occur when there is a complex interaction between genetic factors, environmental conditions, and nutrition. Asthma is also

link to prenatal conditions eg poor nutrition, issues during delivering e.g. low birth rate, premature delivering and infant related conditions such as not been breast fed, diet low in vitamin C and E and childhood obesity (Zhang *et al*., 2018). Asthma is triggered by allergen such as pollen, house dust mites, molds, or a particular food. Thompson (2016), asserted that other common triggers of asthma attacks are emotional upset, aspirin, sulfiting agents (used in wine and beer and to keep greens fresh in salad bars), exercise, and breathing cold air or cigarette smoke.

Global Initiative for Asthma (GINA, 2022), defined asthma as a heterogenous diseases, usually characterized by chronic airway inflammation. Centres for Disease Control and Prevention (CDC, 2022), defined asthma as a lung disease that causes frequent episodes of wheezing, shortness of breath, chest tightness, and night time or early morning coughing. Gupta *et al*., (2018), defined asthma as a lung disorder characterized by airway hypersensitivity to different stimuli that result in airway inflammation, and airway obstruction which results in constriction of airway muscles(tighten), bronchospasm, and airway obstruction. In asthma, the airway linings become swollen and produce excessive mucus hence narrowing the airway and limiting airflow (Cleverland clinic, 2021).

Two decades ago, it was assumed that asthma was an allergic/atopic disease caused by allergen exposure only, recently, research has proved that this model does not represent global asthma patterns and time trends (Pembrey, 2018). Asthma at present is considered an umbrella diagnosis for several heterogeneous diseases that has distinct mechanistic pathways (endotypes) and variable clinical presentations (phenotypes) (Kuruvilla *et al*., 2019). In the past, asthma was classified based on causes and predisposing factors, but presently, asthma is classified based on its phenotype and endotype. This is done to ensure asthma molecular mechanisms is considered as this will enhance asthma management and increase positive patient outcome. Thomson (2016) inferred that the strategies are now evolving to associate molecular mechanisms to phenotype as against previous thought that all asthma was the same and treated with same treatment regimen. These differences in asthma are called phenotypes. To explain asthma phenotype Kahn (2021), in his study expressed that extrinsic or allergic asthma occurs when the immune system overreacts to a harmless substance, such as plant pollens or house dust. Kahan (2021), further stated that intrinsic asthma or non-allergic asthma occurs when other causes than allergens trigger an immune system response. He, however, concluded that it is hard to identify the potential trigger that results in intrinsic asthma in most cases.

Asthma phenotypes include allergic asthma, neutrophil asthma, and aspirin sensitive- asthma, exercised- induced asthma etc. Kuruvilla *et al*., (2019) stated that phenotype is any observable characteristic or trait of a disease, such as development, biochemical or physiological properties while endotype is disease mechanical process. Carr *et al*., (2018) stated that "phenotype" refers to the observable characteristics of the disease in an individual. Endotypes is the specific biological mechanism that causes those observed properties of any given phenotype. Endotype is a subtype of a health condition, which is defined by a distinct functional or pathobiological mechanism.

Kuruvilla *et al*., (2019) in their study concluded that the theoretical basis of endotyping corresponds with the current interest in personalized medicine. This is the bases for GINA action plan in asthma management which aimed at personalizing asthma care. Agache *et al*., (2019) aligned with the above statement as they state that individuals with asthma may have similar clinical symptoms, however, they may respond differently to same asthma treatment regimen. Endotypes describe distinct pathophysiologic mechanisms at a cellular and molecular level that will enhance treatment pattern. Examples of asthma endotypes are Th2-high (eosinophilic) asthma and Th2- low (eosinophilic) asthma. Sharma *et al*., (2022) expressed that the recent classification of asthma based on phenotype and endotype presents a more concrete approach to the study of asthma and this has enhanced asthma management. The present asthma classification has also enhanced asthma diagnosis/assessment which positively impacts asthma management.

Concept of nurses' asthma management practices
Since asthma is heterogenous in nature, its management is also complex and requires a lot of multi-dimensional approach to ensure effective management. Although pharmacological treatment is the mainstay of asthma management, non-pharmacological interventions such as pulmonary rehabilitation, breathing exercises, avoiding allergic triggers, and counseling on smoking can also play integral role in asthma management. Nurses' asthma management practices are in two folds, pharmacological and non-pharmacological methods**.** The goal of asthma therapy is to maintain good symptom control, normal activity levels, and reduced exacerbation risk resulting in preventable emergency visits or hospitalizations (Hall *et al*., 2017). Morris (2022), expressed that pharmacologic management includes the use of control agents such as inhaled corticosteroids, long-acting bronchodilators (beta-agonists and anticholinergics), theophylline, leukotriene modifiers, and more recent strategies of add on therapies such as the use of anti-immunoglobulin E (IgE) antibodies (omalizumab), anti–IL5 antibodies, and anti–IL4/IL13 antibodies in selected patients. Non pharmacological Management is the use of other methods apart from pharmacological products in the management of a condition. In other words, it could be said to be a conservative approach in the management of a condition. These approaches in asthma management include avoidance of environmental exposures, physical activity,

educational interventions, nurse-patient family partnership etc.

Theoretical framework

Mezirow explains that transformative learning leads an individual to questioning oneself about their assumptions, beliefs, feelings, and perspectives on purpose. The valuable in transformational learning is not all about acquiring knowledge or getting new information but the critical reflection made upon such knowledge gained and consequent change of action as a result of the new information (Mezirow, 1978). Transformative learning theory elaborates on the existing point of view, establish new points, transfers previous point of view and transfer habits of the mind. Transformative learning goes beyond acquiring knowledge but rather making fundamental changes in perception and actions upon acquiring new information. The process of transformation "begins with a disorienting dilemma and concludes with a changed self-concept that enables a reintegration into one's life context (Brendel, 2017).

According to Mezirow (1990) learning includes making inferences, discriminating how the new information meets or challenges pre-conceived notion/ ideas, evaluating information itself and lastly solving a problem. It focuses on the idea that learners can adjust their thinking based on new information hence change their actions. Over the years adjustment has been made on transformative learning theory phases, however, Mezirow explained that for transformative learning to take place that not all phases must be experienced or it may be experienced by random.
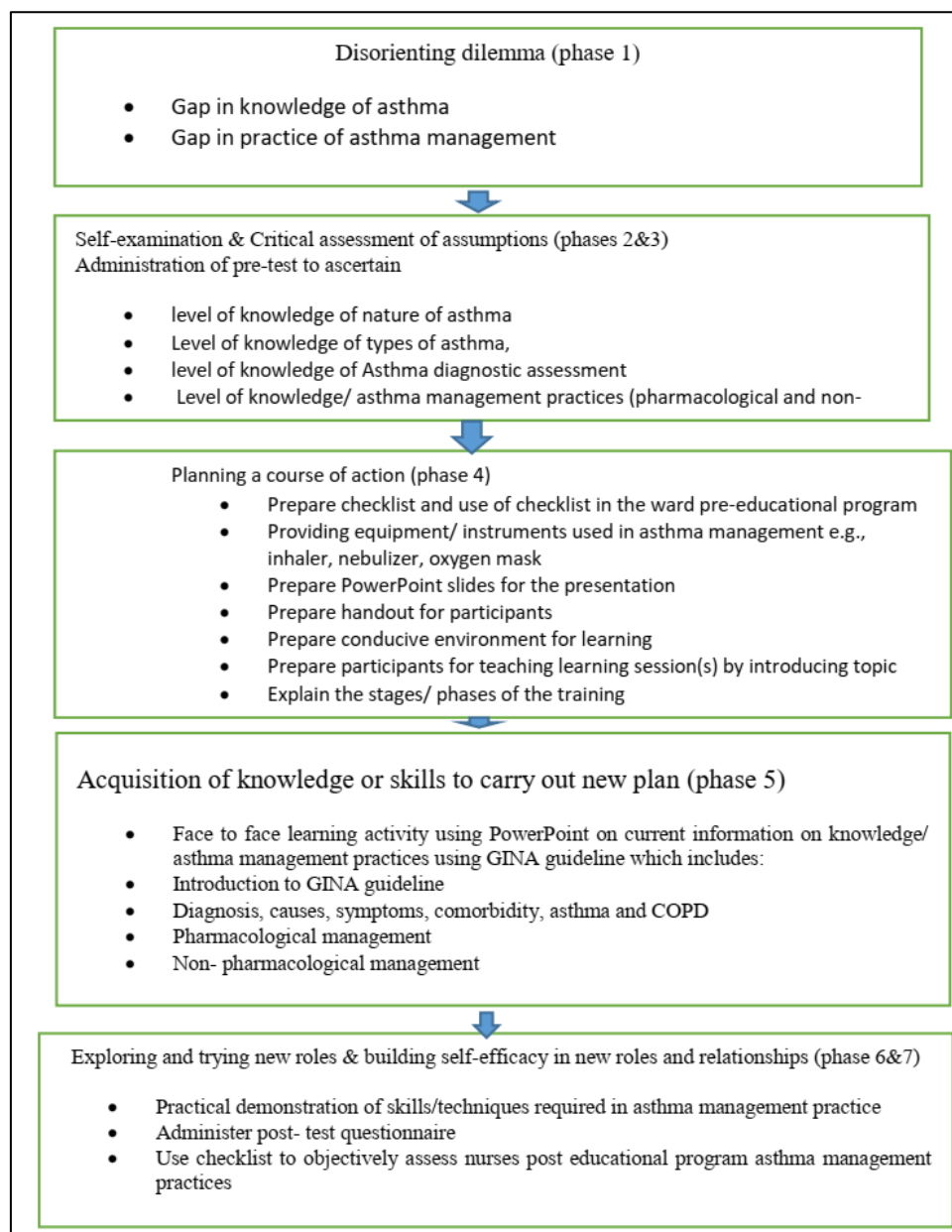
Figure 1: Transformational learning theory adapted from (Mezirow, 1978) by the researcher

Mezirow's seven phases of transformative learning theory was used in this study. The phases are disorienting dilemma, self-examination, critical assessment of assumption, planning a course of action, Acquisition of knowledge or skills to carry out new plan, Exploring and trying new roles and building self-efficacy in new roles and relationship.

Phases of transformative learning theory
Disorienting dilemma (phase 1)

A disorienting dilemma is a situation where a learner finds out that what they thought or believed in the past may not be accurate. Taylor (2000), stated that disorienting dilemma are commonly seen as an integral part of transformative learning as it evokes every conceivable emotion in learners. Within Mezirow's model of ideal typical learning process, a disorienting dilemma represents the initiation of a transformative learning experience usually denoting a life crisis that triggers a questioning of assumptions, resulting in transformed beliefs. This face of transformational learning theory creates dissonance by introducing a problem that does not fit in with existing mental structure. As emotions and feelings provide both the impetus for critical reflection, and the gist on how to reflect deeply (Taylor, 2000). This phase is observed in asthma care when the nurse observed there is a gap in asthma knowledge and practice of asthma management that is affecting patient positive outcome. This gap creates a dilemma in the nurse which triggers emotions that informs the nurse that there is a missing link that needs to be fixed.

Self-examination (phase 2) and Critical assessment of assumptions (phase 3)

After a disorienting dilemma, learners do a self-test of their beliefs and understandings and think about how past experiences connect to the recent dilemma, Individuals who are learning get a perspective transformation when they realize that their perspective may not be the only perspective (Brendel, 2017). The nurse at this stage carries out self-test of the knowledge, beliefs and asthma management practices and question how they map onto the disorienting dilemma. The nurse at this phase is able to take a more comprehensive look at their past assumptions and review them critically.

Michael (2015) asserted that the learner is able to accept that perhaps some of their past assumptions, belief on knowledge of asthma were wrong, and are thereby more open to new information and thoughts. This creates perspective transformation as they are able to look with more unbiased eyes. The nurse become more open to new information thoughts this creates. Though there are arguments on the level of critical assessment of assumptions, within these complex differences, however, theorists such as Mezirow (1991) and Cranton (2016) agree that transformative learning begins when individuals reflect critically upon their assumptions of what they believe to be real, true, or right. Critical reflection is the ongoing process of consciously or unconsciously reviewing and evaluating assumptions to clarify the meaning of experiences both individually and collectively. These complexities, and others, inform the academy that transformative learning is still an emerging theory. At this stage pre-test is carried out to ascertain level of knowledge prior to planning of course of action which is the next level in transformative learning theory.

Planning a course of action (phase 4).

After learners understand how their past assumptions and beliefs may have been wrong and have a perspective transformation, there is need to plan course of action. They are able to consider what kinds of learning they will now need to more fully understand a problem or situation. They will be able to have a strategy for learning new things, seeing new perspectives, talking to new people, and more. Gougoulakis & Christie (2019), stated that Action uses understanding and agreement, via a process of rational and fair discourse, to achieve a mutually acceptable end. This planning phase is the phase where all that need to be done in order to ensure the nurse gets information that will lead to change in action (management practice) takes place.

Acquisition of knowledge or skills to carry out new plan (phase 5).

The person engages in different types of learning to gain specific knowledge and skills following their plan. They may have to learn new things and consider different perspectives in order to fully enhance their learning (Cranton, 2016). This may take extensive work and effort, but this is where the real learning is happening. This is the phase where the nurse is determined to attend the training sessions, learn new things about asthma that will help to close asthma management gap. The learning and acquisition of knowledge of asthma, practice of asthma management is discussed. This phase addresses the gap experienced at the disorienting dilemma phase.

Exploring and trying new roles (phase 6) and building self-efficacy in new roles and relationships (phase 7).

Taylor, (2000) opined that in transformative learning, exploring and trying to understand changes is key to success. It goes beyond just learning about something, but actively working to understand and experience new things. As nurses acquire new knowledge on asthma management and practices, this new knowledge will be transferred to their practice by providing an evidence-based management care. Self-efficacy involves the nurse being able to make own decisions and have our own beliefs. At this stage nurses will carry out practical skills that are required in practices of asthma management. Checklist will be used to evaluate practice of asthma management in the ward to determine if there is a change in their practice to manage patients with asthma.

MATERIAL AND METHODS

Quasi-experimental one group pre-post research design was utilized in this study. The study population comprised of 103 nurses' who treats adults living with asthma in Accident and Emergency unit, female medical ward and male medical ward in University of Port Harcourt Teaching Hospital (UPTH) and Rivers State Teaching Hospital (RSUTH).

Sample size of Fifty-two (52) nurses were purposively selected from a target population of one hundred and three (103) nurses. The nursing leaders selected 50% of the population for this study, as nurses are busy and all of them cannot participants in this. In order to fulfil the objectives of the study, observational checklist was developed. Modified decision-making Delphi method was used to develop the checklist using expert input multistep interactive process technique. The

reliability of the checklist testing was done using Cronbach Alpha coefficient, same yielded .89 using SPSS version 25. Data analysis was descriptive and inferential in nature, Statistic package for social sciences (SPSS) window version 25 was used to analyze the data.

RESULTS

The data analysis was guided by the research questions for this study. A total of 52 copies of the questionnaires were administered pre and post educational program. All 52 returned which yielded 100%

Research question 1: What is the Nurses baseline practice of asthma management pre- nurse led educational program using GINA guideline in Rivers State Teaching Hospitals

Table 1.1: Nurses baseline practice of asthma management pre- nurse led educational program using GINA guideline in Rivers State Teaching Hospitals

Level of Asthma Management Practice	Score Range	N	%
Poor practice	1-47	24	46.2
Moderate practice	48-94	9	17.3
Good practice	95-141	19	36.5
	Total	52	100

Analysis on Table 1.1 above indicates that 46.2% (24) respondents have poor asthma management practice, 17.3% (9) of the respondents has good asthma management practice and 36.5% (19) respondent which is less than ½ of the respondents have good asthma management practice. This indicates that pre-

educational program majority of the respondents had poor asthma management practice.

Research question 2: what is nurse's asthma management self-reporting practices in Rivers State teaching hospital.

Table 1.2: Nurse's asthma management self-reporting practices in Rivers State teaching hospital

Self- reported asthma management	Score Range	N	%
No practice	1-5	22	42.3
Poor asthma practice	6-10	5	9.7
Moderate practice	11-15	15	28.9
Good practice	16-20	10	19.2
	Total	52	100

Analysis on Table 1.2 showed that 42.3% (22) of the respondents never practiced asthma management based on GINA guidelines pre- educational program.9.7 (5) of the respondents had poor asthma management based on GINA guidelines. 28.9% (15) of the respondents had moderate practice of asthma management and19.2% (10) had good asthma management practice. In summary the analysis of this

data indicates that more than half of the respondents did not practice or had poor asthma management practice based on GINA guidelines.

Research question 3: what is the nurses practice of asthma management post- nurse led educational program using GINA guideline in Rivers State Teaching Hospitals.

Table 1.3: Nurse's practice of asthma management post- nurse led educational program using GINA guideline in Rivers State Teaching Hospitals

Level of Asthma Management Practice	Score Range	N	%
Poor practice	1-47	5	9.6
Moderate practice	48-94	5	9.6
Good practice	95-141	42	80.8
	Total	52	100

Analysis on Table 1.3 reviewed that majority of the participants 80.8% (42) had good management practice post- educational program, 9.6% (5) of the participant practiced asthma management poorly and moderately respectively post educational program.

Research question 4: what is the nurses' practices of asthma management pre- and post- nurse led educational program using GINA guideline in Rivers State Teaching Hospitals

Table 1.4: Difference in nurses' observed asthma management practices pre- and post- nurse led educational program using GINA guideline in Rivers State Teaching Hospitals

Level of Asthma Management Practice	Score Range	Pre-test (n)	%	Post-test (n)	%
Poor practice	1-47	24	46.2	5	9.6
Moderate practice	48-94	9	17.3	5	9.6
Good practice	95-141	19	36.5	43	80.8
	Total	**52**	**100**	**52**	**100**

Analysis of the data in table 1.4 indicates that post educational program, only 9.6% (5) participants had poor asthma management practice as against 46.2 (24) participants' pre- educational program. Also, 80.8% (43) participants have good asthma management practice post educational program against 36.5 (19) participants pre - educational program. This indicates positive effect of educational program on management of asthma using GINA guidelines post educational program.

Hypothesis

There is no significant difference in practices of asthma management among nurses before and after nurse led educational program using GINA guidelines in Rivers State Teaching Hospitals.

Table 1.5 Summary of paired-sample t-test analysis on the difference in nurses' observed asthma management practices before and after nurse led educational program using GINA guidelines in Rivers State Teaching Hospitals

Asthma Management	N	$\bar{x}$	SD	Df	t_{cal}	t_{tab}	Sig.	Decision
Pre-test	52	11.35	2.20	51	51.23	1.96	0.00	Reject: H_{02}
Post-test	52	17.58	1.54					

Table 1.5 indicates that $t_{cal} = 51.23$, df = 51, and $t_{tab} = 1.96$. Therefore, since $t_{cal} > t_{tab}$ and $P < 0.05$, then there is significant difference in nurses' asthma management practices before and after nurse led educational program using GINA guidelines in Rivers State Teaching Hospitals. Hence, the null hypothesis two is rejected at 0.05 level of significance.

DISCUSSION OF FINDINGS

Discussion of this study is done in line with the findings. The researcher's intention was to educate nurses on practice of asthma management using GINA guidelines in Rivers State Teaching Hospitals, thus evaluate the effect of the educational program on practice of asthma management. The findings were discussed based on research objectives and research questions.

The findings indicates that the participants had poor asthma management practice pre- educational program. As majority of the participants 46.2% (24) had poor asthma management practice, and 17.3% (19) which is less than ½ of the respondents had moderate asthma management practice. The findings are in line with the findings of a study by Swami *et al.*, (2021) which stated that all nurses that participated in the study demonstrated poor asthma management practice. This also collaborated with the findings of Xie *et al.*, (2021) which concluded that most of the nurses that participated in the study could not administer asthma management properly. The findings of this study are of major concern in nursing practice, as GINA stated that poor basic asthma management practice such as inhaler technique results in 80% of asthma exacerbation. Wittenberg *et al.*, (2018), asserts that the starting point of solving asthma health problem is through the provision of evidence-based health education to the patients. If nurses who are to educate the patients are not knowledgeable in skills required in asthma management, it becomes difficult to impact such knowledge to the patient for appropriate self-care management and this poses a threat to the patient as inadequate health practices among nurses is detrimental to a population's health (Munangatire *et al.*, 2022). This is also in line with the findings of Lilitwat & Vorakunthada (2018) which concluded there was poor asthma management practice among the nurses pre - educational program, and nurses could not comprehensively educate asthma patients on asthma self-care management.

Finding of the study also showed that on grade scale 1-5, when score of 20 indicates that the participants always engage in asthma management practice, 42.3% (22) of the participants never practiced asthma management based on GINA guidelines pre- educational program. only 19.2% (10) participants had good asthma management practice. In summary the analysis of this data indicates that more than half of the participants did not practice or had poor asthma management practice based on GINA guidelines pre -educational program and only 19.2% (10) practiced good asthma management. In

line with the above findings, there seem to be agreement between self -reported asthma management practice and observed asthma management practice of the participants. This can be attributed to lack of evidenced based asthma knowledge and lack of the use of stipulated evidenced based guideline which lead to discrepancies in asthma management practice among nurses. This is in line with the findings of Metwally (2019) which concluded that the participants had poor asthma management practice pre- educational program. The findings of this study have negative effect on nursing practice as nurses.

Nurses' practice of asthma management after implementing of educational program demonstrated significant amelioration with overwhelming majority 80.8% (43) of the participants having good practice of asthma management post – educational program as against 36.5% (19) participants pre-educational program. This is in line with assertion of Axelson *et al.*, (2020) which stated that educational program strengthened the healthcare professionals' management practices.

The findings also agreed with the findings of Moscatelli (2020) which concluded that the program increased management practices of nurses that participated in the educational program. The finding is also is in agreement with the findings of Metwally *et al.*, (2019), which concluded that there was a significant improvement of nurses' practices of asthma management throughout the three phases with total average mean score 4.60±2.21 before program, increased to 9.18±1.27 post program.

The findings also imply that for effective asthma management there is need to educate nurses on evidence-base guidelines.

Thus, new trend among other healthcare practitioners based on improving management practice through guideline guided educational programs could enhance nurses' knowledge and consequently improve their practice. This is in line with recommendation of National Heart Lung and Blood Institute which strongly recommend the Provider Asthma Care Program (PACE), which is an interactive educational program to improve providers awareness of existing asthma management guideline. It is very important that nurses have adequate evidence-based knowledge of asthma and its management practices to be able to administer evidence-based care.

Significant difference was found in knowledge of asthma pre and post nurse led educational program using GINA guideline**.** Since the calculated t-value (51.23), is greater than the critical t-value (1.96) at df of 51 at 0.05 level of significance. This finding is unlikely to occur if there is no difference between pre and post educational practice of asthma management using GINA guidelines. Thus, it is concluded that there appears to be difference between nurses' asthma practice of asthma management pre and post educational program, the hypothesis is therefore rejected. In light of the above the educational program was impactful on the asthma management practices of the participants and this will in-turn led to good asthma management practice which has a positive implication on nursing practice.

CONCLUSION

The study concluded that nurse-led educational program using adopted GINA guidelines enhanced practice of asthma management among nurses. This implies that with appropriate education and skills, nurses can enhance their practice of asthma management which will in turn close asthma management' gap.

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