

**CLINICAL VALIDATION OF NORTH AMERICA NURSING DIAGNOSES
ASSOCIATION INTERNATIONAL 'ACUTE PAIN' DIAGNOSIS AMONG POST-
OPERATIVE ADULT PATIENTS AND NURSES IN OWO NIGERIA**

Abiodun Oluwaseun. O¹, Olaogun Adenike. A. E², Adereti Chinma Stella², Ayeni Adebunola R¹.

¹Achievers University, Department of Nursing Science, Owo

²Obafemi Awolowo University, Ile – Ife. College of Health Sciences, Faculty of Basic Medical Sciences, Department of Nursing Science,

ABSTRACT: *Introduction: Acute pain is one of the commonest symptoms experienced by post-operative patients hence it is used often as a diagnosis. There is need for its validation for confirmation through its defining characteristics. Methodology: Exploratory descriptive design (mixed method) using purposive sampling method was used. Ninety- three nurses and ninety-eight patients formed the sample size respectively. Two different modified Ferhing questionnaires were used and In-depth interview was done for 17 nurses. The data were analyzed using percentages and inferential statistics. Results: Two major ($r= 0.8$) six minor characteristics ($r \geq 0.6$) and a phony diagnosis (anxiety $r=0.6$) were validated by the nurses while five minor ($r \leq 0.6$) defining characteristics were validated by patients. Conclusion: The study concluded that nurses validated two major characteristics, six minor characteristics and one phony defining characteristic while patients validated five minor defining characteristics.*

KEYWORDS: Clinical Validation, Acute Pain, Nurses, Post-Operative Patients

INTRODUCTION

Background

Advances in knowledge and use of the nursing process have driven the construction of standardized terminologies (for the elements of nursing practice diagnosis, intervention and outcomes) to enable the classification and organization of these elements into coherent units of cross referenced information. These classification systems facilitate the communication and encoding of information for entry into computer databases and provide other major benefits to clinical practice, teaching and research in nursing (Almeida, Lukena, Franzen & Laurent, 2001).

Standardized nursing language is a body of terms used in the profession that is considered to be understood in common (Herdman, 2012). The use of common terms promotes patients' safety by allowing nurses to quickly and efficiently understand the aspects of a patient's need. A nursing diagnosis is a professional judgment based on the application of clinical knowledge which determines potential or actual experiences and responses to health problems and life processes (Herdman, 2012). A significant difference between nursing diagnosis and medical diagnosis is that it is done, whenever possible, in partnership with the individuals, families and/or communities involved. The list of NANDA-I nursing diagnosis can be applied to individuals, families, or communities (Herdman, 2012).

Pain is the most common reason for physicians' consultation in most developed countries (Debono, Hoeksema & Hobb, 2013). The diagnosis is made through the defining characteristics with which patients present in hospitals.

Despite the vast amount of current knowledge, uncontrolled post-operative pain is reported by appropriately 50% of patients. Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage (International Association for the Study of pain, 2015). Pain is not a discrete sensory experience that is switched on by a particular or identifiable set of pain pathway to elicit an invariant sensation. Although, from our everyday experience, we tend to associate pain only with an intense or noxious peripheral stimuli in most patients, pain arises either in the apparent absence of any peripheral input (spontaneous pain) or in response to low intensity or innocuous stimuli that are usually not associated with pain. The induction of pain encompasses multiple different neurobiologic components originating in a complex fashion from mechanisms that may manifest, interact and that are different and changeable (Woolf, 2001).

Acute pain has strong cognitive and emotional components and it is still poorly understood (Woolf, 2001). It is a highly subjective state in which a variety of unpleasant situations and a wide range of distressing factors may be experienced by the sufferer (Herdman, 2012). It therefore has defining characteristics such as patient's report of pain guarding behaviour, facial mask, autonomic responses e. g. change in blood pressure and diaphoresis (Herdman, 2012). Knowledge of these features may assist in diagnostic accuracy. Therefore, to contribute to diagnostic accuracy, the nursing diagnosis of acute pain in post-operative patients who usually have varying degrees of pain must be clinically validated to enhance correct assessment and adequate management of pain to improve patients' outcome. There are many potentially successful approaches available for pain management, yet there is still a shortage of knowledge about the strategies used by health professionals especially how reliable the strategies are. The fact that patients often undergo a deal of suffering from pain and lack of adequate relief may be considered as an indicator for shortage of knowledge. Clinical studies from different parts of the world have confirmed that in the past three to four decades that 20% to 80% of post-operative patients suffer from inadequately treated pain Woidehaimanot, Eshetie & Kerie, (2014). Establishment of the nursing diagnosis of acute pain in any post-operative patient requires a careful assessment by observing and noting the defining characteristics during assessment. Valid and reliable assessment of pain is essential for both clinical trials and effective pain management. The nature of pain makes objective measurement impossible. Acute pain can be reliably assessed, both at rest (important for comfort) and during movement (important for function and risk of post-operative complication) (Breivik et al, 2008).

According to Gordon (1987), validity of a nursing diagnosis describes the degree to which a cluster of defining characteristics describe a reality that can be observed in client-environmental interactions. The fact remains that, for nurses to provide care that is based on the clinical reasoning process, it is essential that nursing diagnosis (ND) be accurate. In a validation study that was done by Ferreira, Predebon, da Cruz Dde, & Rabelo (2011) among post-operative heart surgery, patients in School of Nursing University of Sao Paulo, Brazil in 2000 and in another study which was conducted by NANDA International in 2011, the results were similar as majority of the defining characteristics were validated. However, no study has been done in Nigeria on clinical validation of acute pain diagnosis despite the fact that major, moderate and minor surgical operations are carried out in our environment. Patients have post-operative pains of varying degrees depending on the extent of the surgeries, hence, there is need to validate the

protocol of diagnosing acute pain among adult post-operative patients. The recommendation of NANDA – I after the validation study among children in 2011 was that the study must be reproduced in different populations to contribute to the accuracy and appropriateness of diagnosis.

There are eighteen defining characteristics namely:

1. Changes in appetite
2. Changes in blood pressure
3. Changes in heart rate
4. Changes in respiratory rate
5. Coded report
6. Diaphoresis
7. Distraction behaviour
8. Expression behaviour
9. Facial mask
10. Guarding behaviour
11. Narrowed focus
12. Observed evidence of pain
13. Position to avoid pain
14. Protective gestures
15. Papillary dilation
16. Verbal report of pain
17. Self – focus
18. Sleep disturbance (Adopted from NANDA – I textbook, 2012 Edition, page 478).

Clinical Validity Model By Richard Ferhing

There are three models that can be used according to Richard Ferhing (1987) but one was considered in this study. The one that was considered is the Clinical Diagnostic Validity (CDV) model. This model is based on obtaining evidence for the existence of a given diagnosis from the actual clinical setting. A clinical observation approach is used with expert clinicians doing the observations and ratings.

Steps In Clinical Diagnosis Validation (Cdv) Model Using The Patient Focused Approach

1. Obtain a sample of patients (subjects) with the pre- established diagnosis of acute pain.
2. Validate that the diagnosis was correct through confirmation of the diagnosis by a clinical nurse specialists.
3. Develop a list of the defining characteristics of the diagnosis that is being tested with a rating scale. The list of defining characteristics is then given to a patient with the pre-identified nursing diagnosis. The patients are then asked to rate the defining characteristics on how they indicate their feelings and behaviours on a scale of 1 to 5. The rating scale would be interpreted as follows: 1 = Not at all characteristic of me; 2 = very little characteristic of me; 3 = somewhat characteristic of me; 4 = considerably characteristic of me; 5 = very characteristic of me.
4. Weighted ratios would be calculated for each of the defining characteristics. The weights are as follows: 5 = 1, 4 = 0.75, 3 = 0.50, 2 = 0.25 and 1 = 0.

5. The defining characteristics with weighted ratios of less than 0.05 are discarded. (Done when there are confirmation results).
6. Defining characteristics with weighted ratios greater than or equal to 0.80 will be considered as “major” while those with weighted ratios greater than 0.50 will be labeled as “minor”. This tentative step is taken only until results have been confirmed with repeated studies or with generalizable study. Until such confirmation is obtained, the defining characteristics will be called “tentative major indicators”.
7. Obtain a total CDV by summing the individual ratio and dividing by the total number of defining characteristics of the tested diagnosis. Defining characteristics with ratio less than or equal to 0.50 would not be included in total score.

Relevance of The Model to the Study

The concept of validation is important to be able to make the available nursing diagnoses useful maximally in clinical practice. The clinical diagnosis validation model is patient-focused and this informs its usefulness in this study. Post-operative patients have pre-established diagnosis of acute pain after surgery, the defining characteristics of acute pain are manifested by patients depending on their pain threshold, cultural belief and whether a major, intermediate or minor surgery have been performed them. Furthermore, as the defining characteristics are manifested they are rated on a scale of 1-5 (1 has the least weight while 5 has the highest weight). Patients and nurses observe and record the indicators according to the scale provided by Ferhing. Defining characteristics with weighted average below 0.8 are regarded as minor while those between 0.8 and 1.0 are major indicators of acute pain. This process should be repeated in other study populations before the diagnosis is considered to be able to confirm the diagnosis.

Objectives: The objectives of the study were to:

- a) Determine the extent of identification of nurses with the defining characteristics of acute pain as indicated by NANDA – I (2012).
- b) Determine the extent to which the defining characteristics of acute pain are indicative of post-operative pain in patients themselves.

Hypotheses:

There is no significant association between nurses’ professional qualifications and identification of the defining characteristics of acute pain.

There is no significant association between the sex of post-operative patients’ and identification of the defining characteristics of ‘acute pain’.

METHODOLOGY

Design: The study utilized explorative descriptive design (mixed method) because validation study is new in the nation this flexible design provided an opportunity to examine all aspects of the problem and describe how to clinically validate the diagnosis of acute pain among adult post-operative patients.

Setting: This study was conducted in a tertiary hospital setting (Federal Medical Centre, Owo) which is the headquarter of Owo Local Government Area of Ondo-State, Nigeria. It is a major referral centre in South- Western Nigeria. Resident Doctors, student nurses and interns are trained there.

Study Population: The study population was registered nurses who were working in surgical wards and post-operative patients that were nursed there.

Sample Size and Sampling Size Determination: The sample size was purposively selected according to participants' readiness and acceptance to participate in the study. Hence ninety-three (93) nurses and ninety-eight (98) patients formed the study population.

Inclusion Criteria for patients:

- 1) Be 18 years of age and above
- 2) Must have had surgery within the last 72 hours
- 3) Must be hospitalized after surgery

Exclusion criteria:

Unconscious patients
Day surgery patients
Hospitalized post-operative patients
Below 18 years of age

Instrumentation: Two questionnaires and one in-depth interview guide were used. The questionnaires were modified Ferhing's Clinical Diagnostic Validation (CDV) instrument of 1987 (CDV) with three sections.

The nurses questionnaires: It is a modified Ferhing's Clinical Diagnostic Validation (CDV) model of 1987 (CDV) questionnaire with three sections. Section A had 9 items on socio – demographic data, Section B has 24 items rated on a scale of 1-5 as follows; 1 = Not at all characteristic of the patient, 2 = very little characteristic of the patient, 3 = somewhat characteristic of the patient, 4 = considerably characteristic of the patient, 5 = very characteristic of the patient for validation of defining characteristics. The essence of including the phony ones was to know if the respondents can identify the real defining characteristics or not and also find out if any of them can be real and obtainable among post-operative patients in this environment so that it can be subjected to further testing.

The Patients questionnaire (Appendix): This is also a modified Ferhing CDV instrument. Section A has the socio-demographic variables. Section B had 24 items which is rated on a scale of 1 - 5 as follows; 1 = Not at all characteristic of me, 2 = very little characteristic of me, 3 = somewhat characteristic of me, 4 = considerably characteristic of me, 5 = very characteristic of me. It took about 20 minutes to administer each questionnaire.

In – depth interview for nurses (Appendix): This is a self-developed instrument by the principal researcher. It had two sections. It was modified by the researcher's supervisor and other experts in pain management. Section A had the socio-demographic/professional characteristics. Section B had open ended question

Determination of validity and reliability: The pilot study revealed that the instruments were reliable for use in the main study as the Cronbach's Alpha were 0.767 and 0.8371 from the

nurses and patients questionnaires. Furthermore, content and face validity of the instruments were established by the researcher's supervisor and other experts in pain management.

Procedure: Data collection took three months. Five research assistants were trained on how to administer the questionnaires after the ethical clearance was obtained. Each respondent was approached individually and informed consent was obtained from each of them after introducing ourselves to them and explaining the purpose of the study. The principal researcher and the research assistants made several efforts to visit the patients until the actual number of patient respondents was obtained. A Modified Clinical Diagnostic Validation (CDV) model by Ferhing (1987) was used to obtain clinical information directly from the subjects because the nursing diagnosis involves a more cognitive or affective responses. The patients' questionnaire was used to obtain data for clinical validation (Evaluate post-operative patients through the cues in defining characteristics with the questionnaires that were given to them), while the nurses questionnaire were used to obtain data for content validation (Evaluate post-operative patients through the defining characteristics with the questionnaires that were given to them). It took about 30 minutes to administer a questionnaire. The interview sessions were done one by one and they took place at pre-agreed places and times. Each interview session took about 40 minutes. The sessions were audio-recorded and written down verbatim before analysis.

Analysis: Data were analyzed using the Statistical Package for Social Sciences (SPSS) version 17.0. Descriptive statistics such as frequencies, percentages and chi-square were used to present summary tables while hypotheses generated were tested with Chi-square. Responses from the interview sessions were analyzed using typical verbatim reports.

RESULTS

Table 1: VALIDATION OF THE DEFINING CHARACTERISTICS OF ACUTE PAIN BY NURSE RESPONDENTS (N = 93)

S/N	DEFINING CHARACTERISTICS	WEIGHTED SCORES
01.	Verbal report of pain	0.8
02.	Sleep disturbance	0.8
03.	Observed evidence of pain	0.7
04.	Facial mask (Squeezing of face)	0.7
05.	Expressive behaviour	0.7
06.	Position to avoid pain	0.7
07.	Diaphoresis	0.6
08.	Changes in blood pressure	0.6
09.	Anxiety	0.6
10.	Changes in respiratory	0.5
11.	Changes in heart rate	0.5
12.	Guarding behaviour	0.5
13.	Self – focus	0.5
14.	Distractive behaviour	0.4
15.	Changes in muscle tone	0.4
16.	Nausea	0.4
17.	Narrowed focus	0.4

18.	Protective gestures	0.4
19.	Change in appetite	0.4
20.	Pupillary dilatation	0.3
21.	Dyspnoea	0.3
22.	Change in mental status	0.3
23.	Hopelessness	0.3
24.	Coded report	0.3

Table 1 shows the defining characteristics that were validated by nurses, eight defining characteristics (Verbal report of pain 0.8, this was corroborated in the in-depth interview: “Verbal report and ... (Participant 7, RN, RM)”, sleep disturbance 0.8, it was also corroborated in the in-depth interview: ...sleep disturbance and ... (Participant 14, RN, RM)”, observed evidence of pain 0.7, expressive behaviour 0.7, facial mask 0.7, this was also corroborated in the in-depth interview: facial expression and ... (Participant 1, BNSc)” position to avoid pain 0.7, diaphoresis 0.6, this was also corroborated in the in-depth interview: “ ... confusion and sweating, (Participant 8, RN, RM)”, and changes in blood pressure 0.6 which was also corroborated in the in-depth interview as follows: “altered vital signs (Participant 8, RN, RM)” $r > 0.5$. The rest were not validated $r < 0.5$. The first two with $r > 0.80$ were major defining characteristics. A phony one was also validated (anxiety with 0.6). The phony defining characteristics that were added had the following scores; anxiety 0.6, changes in muscle tone and nausea 0.4, while dyspnoea, change in mental status and hopelessness had 0.3.

Table 2: VALIDATION OF ACUTE PAIN DEFINING CHARACTERISTICS NURSING DIAGNOSIS BY PATIENTS (N = 98)

S/N	DEFINING CHARACTERISTICS	WEIGHTED SCORES
01.	Verbal report of pain	0.7
02.	Position to avoid pain	0.6
03.	Facial mask (Squeezing of face)	0.6
04.	Observed evidence of pain	0.6
05.	Sleep disturbance	0.6
06.	Guarding behaviour	0.5
07.	Change in appetite	0.4
08.	Protective gestures	0.4
09.	Diaphoresis	0.4
10.	Coded report	0.4
11.	Expressive behaviour	0.4
12.	Changes in muscle tone	0.3
13.	Narrowed focus	0.3
14.	Changes in blood pressure	0.3
15.	Self – focus	0.3
16.	Change in mental status	0.3
17.	Distractive behaviour	0.3
18.	Changes in heart rate	0.3
19.	Anxiety	0.3
20.	Changes in respiratory pattern	0.3
21.	Dyspnoea	0.2
22.	Nausea	0.2
23.	Hopelessness	0.1
24.	Pupillary action	0.1

Table 2 shows all the defining characteristics that were validated by the patients, they are; Verbal report of pain 0.7, facial mask 0.6, observed evidence of pain 0.6, position to avoid pain 0.6 and sleep disturbance 0.6. Others were not validated. There is no major defining characteristic that was validated by the patients as none had a weighted ratio of 0.8 or more. The phony defining characteristics that were added had the following; anxiety 0.3, changes in muscle tone 0.3 and nausea 0.2, dyspnea 0.2, change in mental status 0.3 and hopelessness 0.1.

Table 3: There is no significant association between nurses' years of working experience and extent of identification of the defining characteristics of acute pain.

		Nurses' identification of the defining characteristics of 'acute pain'.			Total	X ² df p – value
		Poor identification	Fair identification	Strong identification		
Working Experience (in years)	2- 5yrs	6 21.4%	12 23.1%	2 15.4%	20 21.5%	X ² – 1.32
	6-9yrs	8 28.6%	18 34.6%	4 30.6%	30 32.3%	
	10-13yrs	9 32.1%	12 23.1%	4 30.8%	25 26.9%	df = 8
	14-17yrs	2 7.1%	4 7.7%	1 7.7%	7 7.5%	
	18+ years	3 10.7%	6 11.5%	2 15.4%	11 11.8%	
TOTAL		28 30.1%	52 55.9%	13 14.0%	93 100.0%	p- value = 0.995

Using the above table, the chi-square = $X^2 = 1.32$, $df = 8$ and level of significance = 0.995 with $p > 0.05$, there is no significant association between respondents' years of experience and the extent of identification the defining characteristics of acute pain. The hypothesis is accepted.

Table 4: There is no significant association between the sex of post-operative patient respondents' and identification of the defining characteristics of acute pain.

		Gender		Total	X ² df p – value
		Male Patients	Female Patients		
Extent of identification of patients with the defining characteristics of nursing diagnosis	Poor identification	21 40.4%	31 59.6%	52 100.0%	X ² = 3.36 df = 2
	Fair identification	10 25.6%	29 74.4%	39 100.0%	
	Strong identification	1 14.3%	6 85.7%	7 100.0%	P = 0.19
TOTAL		32 32.7%	66 67.3%	98 100.0%	

Using the above table, $X^2 = 3.36$, $df = 2$, level of significance = 0.19 with $p > 0.05$, there is no significant association between post-operative respondents' sex and identification of the defining characteristics of acute pain. The hypothesis is accepted.

Discussion of findings

Adequate knowledge of nurses is very important in effective pain management. Early recovery and prevention of complications are connected with adequate pain assessment, diagnosis and management hence nurses should be keen about them in clinical practice. Findings from the study revealed that eight defining characteristics (Expressive behaviour, facial mask, observed evidence of pain, diaphoresis, position to avoid pain, changes in blood pressure, verbal report of pain and sleep disturbance) were validated with their weighted score between 0.6 and 0.8 by nurses ($r > 0.5$). A phony diagnosis (anxiety) was also validated. This was also identified by some nurse respondents in during the interview sessions. Out of these validated defining characteristics, only two (verbal report of pain and sleep disturbance) were major defining characteristics. The two were among those that were validated among hospitalized patients and post-operative heart patient by Ferreira, Predebon, da Cruz Dde & Rabelo (2011).

In the in-depth interview, nurses identified eight defining characteristics that were listed in NANDA-I textbook (2012). This is similar to the work Renata, Katarina, Juraj & Darja (2014) that was done among 82 Slovak nurse experts and 79 Czech nurse experts. The Slovak nurse experts validated four major defining characteristics which are position to avoid pain, observed evidence of pain, verbal report of pain and protective gestures while the Czech nurse experts identified eight major defining characteristics which are; position to avoid pain, observed evidence of pain, verbal report of pain, protective gestures, guarding behaviour, changes in heart rate, expressive behaviour and sleep disturbance. The few number of defining characteristics that were identified as major by nurses in this study may be related to the fact that the concept of standardized nursing language is not in use and unpopular in Nigeria and that many of them are yet to have first degree certificates in nursing which was also reported among the Slovak nurse experts in the content validation study done by Renata et al (2014). Cultural factors as reported during the in-depth interview sessions may have some influence on their submissions.

The study also revealed that patient respondents validated five major defining characteristics namely; Verbal report of pain 0.7, facial mask 0.6, observed evidence of pain 0.6, position to avoid pain 0.6 and sleep disturbance 0.6. None of the five defining characteristics was rated above 0.7, this means that none of them was a major defining characteristic. This is at variance with the nurse respondents' values. This may be related to the fact that they are not trained medical workers, another reason is that they are adults who might have higher pain threshold and cultural influences that negate expression of pain openly. This was corroborated in the in-depth interview as some of nurse respondents submitted that culture and educational background affect patients' perception of pain to a large extent. It was revealed that culturally in some places in Nigeria especially among the Fulanis people believe that it is a taboo to show any sign of discomfort when they have pains especially in public.

The first hypothesis which is, there is no significant association between nurses' years of working experience and extent of identification of the defining characteristics of acute pain was accepted. This was proved in the study as its chi – square = $X^2 = 1.32$, $df = 8$ and level of significance = 0.995 with $p > 0.05$, there is no significant association between respondents'

years of working experience and the extent of identification the defining characteristics of acute pain.

The second hypothesis which says there is no significant association between the sex of post-operative patient respondents' and identification of the defining characteristics of acute pain was accepted as $X^2 = 3.36$, $df = 2$, level of significance = 0.19 with $p > 0.05$. This shows that there is no significant association between post-operative respondents' sex and identification of the defining characteristics of acute pain.

Implication to Research and Practice

Research

A lot of research has been done in the Western world in standardized nursing languages development and implementation. In Nigeria, very little research studies have been done in this area of nursing, this is related to many factors ranging from understaffing, harsh working conditions, unavailability of nurse consultants and specialists. This study will provide empirical data for confirming the nursing diagnosis of acute pain and contribute to modifications that may be necessary. There is also need to do more validation studies on acute pain and other standardized nursing languages in different parts of Nigeria because of the complexity of her culture in terms of many ethnic groups therein. Lastly, more research should be done on the phony defining characteristic (anxiety) which was validated in the questionnaire and the in-depth interview.

Practice

Validation studies assist the various nursing diagnoses to be able to stand on principles and be well proven. This is to allow them withstand professional criticisms, applicable to patients in different settings and make nursing practice easier in terms of accuracy of nursing diagnosis which are used in day to day care of patients. Anxiety which was one of the phony defining characteristics which was validated by the nurses should be put to test. There is need for nurses to update their knowledge as they practice so as to bridge the gap between knowledge and their years of working experience in clinical practice.

CONCLUSION

The study clinically validated NANDA-I protocol of diagnosing acute pain among adult post-operative patients and nurses in Federal Medical Centre, Owo. It concluded that nurses validated two major, six minor defining characteristics and a phony defining characteristic. Patients validated five minor defining characteristics of acute pain.

Limitation of the Study: Considering the sample size and the setting, the generalizability of the results might be limited to the locality and the state where the research was carried out.

Recommendation

Nurses in Nigeria should be provided with NANDA- I textbooks and other standardized language books so that we can be fully integrated into the current trends in making nursing diagnosis, implementing and achieving realistic goals in patients care. Electronic forms of NANDA-I textbooks and other standardized language books should be provided in our tertiary

health institutions so as to facilitate integration into the use of standardized languages in Nigeria and aid proper documentation. There is need for nurses to change their orientation so as to meet the challenges of this present time. Training and re-training of nurses should be made a priority and nurses should use every available opportunity to update their knowledge. It is also recommended that more validation studies are needed especially in Nigeria on standardized nursing languages so that nurses can have one voice in patients management and sustain quality nursing care. The phony diagnosis (anxiety) which was validated needs further testing.

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ABIODUN OLUWASEUN O.
COLLEGE OF NATURAL AND APPLIED SCIENCES,
DEPARTMENT OF NURSING,
ACHIEVERS UNIVERSITY
P.M.B 1030,
OWO,
ONDO- STATE,
NIGERIA.