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Evaluation of the Use of NANDA-I nursing diagnoses, Nursing Outcome Classification and Nursing Intervention Classification for Documentation of Care in Primary Health Centres, Ijebu Ode

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Abstract

Background: *Documentation of nursing care is core to the Nursing profession and to share information on patients/clients with other nurses and between clinical disciplines and care settings, data needs to be recorded and stored in a standardized form. Therefore, to make the care nurses give to be visible, NANDA-I, NIC & NOC was endorsed to be used for documentation.*

Purpose: *The purpose of the study was to evaluate whether NANDA-I, NIC, & NOC was used for documentation of care at the maternal and infant welfare units of selected Primary Health Centres (PHCs).*

Methodology: *A retrospective descriptive research design was adopted in this study. Random sampling technique was used to select 5 PHCs. All patient nursing care plan records documented with NANDA-I, NIC & NOC was utilized for data analysis. Data was analyzed using the Statistical Package for Social Sciences (SPSS) version 17.0 for both descriptive and inferential statistics.*

Results: *Findings revealed that nursing care was documented using NNN. There was no significant difference in the NANDA-I nursing diagnoses, NIC & NOC used as the t* calculated value of -1.00 was lesser than the critical value of 1.96, which was not significant at 0.05 alpha levels.

Conclusion: *This study has evaluated the documentation of care using NNN in PHCs. It is imperative to state that using NNN for documentation of care is a way of showing evidence-based practice. The researcher therefore recommends that the use and documentation quality of the NNN be evaluated periodically, and corresponding feedbacks given to nurses.*

Keywords: *Evaluation, Documentation, NANDA-I nursing diagnoses, Nursing Intervention Classification, Nursing Outcome Classification.*

Introduction

The care nurses provide to sustain life, enable recovery, alleviate suffering and promote health without appropriate, adequate and quality documentation with appropriate language can be referred to as a waste of effort. To share information on patients/clients with other nurses and between clinical disciplines and care settings, data needs to be recorded and stored in a standardized form. Also, health care disciplines, especially nurses, are required to develop quality measures of documentation using standardized nursing terminologies to reflect the quality of health services they render (Allen, Chapman, Conor & Francis, 2007).

Although nurses have always been an integral part of the health care system, their contributions have largely been invisible in the health database because of poor documentation of care as well as lack of use of standardized nursing terminologies. Nurses' documentation of the care they give to patients/clients in terms of diagnoses they treat, the interventions used to treat the diagnoses, and the resulting outcomes/responses are necessary for evaluation of care (Bostick, Riggs, & Rantz, 2003). But in the discipline of nursing, however, data have been buried in a narrative, understructure format, in which aggregation of data is difficult. Nurses have been underrepresented in the communication of healthcare data, research, and education (Burkhart & Androwich, 2004). Thus, nurses and nurse researchers have recognized the need for a systematic description of nursing interventions so that the contribution of the nursing profession to patient care is recognized and understood (Bulechek, Butcher, & Dochterman, 2008).

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In the bid to make the care nurses give to be visible, Standardized Nursing Languages (SNLs) were developed and the American Nurses Association (ANA) recognized 13 terminologies and datasets in use in nursing practice information infrastructure (ANA, 2009). Using standardized languages, nursing can define its unique body of knowledge and evaluate the contribution of nursing both in quality and in cost-effectiveness. The use of SNLs in nursing documentation, such as NANDA-I, Nursing Outcomes Classification (NOC), and Nursing Interventions Classification (NIC), makes it possible to capture all of the contextual elements of the nursing care process and to document nursing care provided to patients.

However, most practicing nurses in Nigeria especially at the Primary Health Care (PHC) settings continue to have challenge in the use of standardized nursing terminologies (NANDA-I, NOC, & NIC) (NNN). In fact, patient outcomes were a new idea to most nurses. There were no lists of approved nursing diagnoses and defining characteristics grounded on local realities in Nigeria. This does not mean that expert clinical judgment was lacking, it was just less formalized in its teaching and practice. Nursing documentation was not structured as there were no patient plans of care at these facilities for documentation. There were no nursing diagnoses as well and nurses use mainly a language associated with medical discourse. Nursing care was not documented at all except for medical treatments given to patients that were recorded on a big notebook.

It is a fact that without standardized language, nursing documentation and evaluation have been shown to be unspecific and ambiguous and can lead to uncertainty, impaired information exchange and discontinuity of care (Bakken, Holzemer, Portillo, Grimes, Welch, & Watland, 2005; Beyea, 1999). Hence, SNLs have been established to provide uniform nomenclature for the diagnosis, intervention and evaluation components of the nursing process. This standardization of terminology facilitates communication about care across settings, is useful in documentation and entering data into electronic health records, and is valuable in promoting research on the effectiveness or outcomes of care. According to Dochterman and Bulechek, (2004) SNLs also have implications for competency evaluation, reimbursement for services and curriculum design, improve the quality of nursing care, guide policy, and assist nurses in clearly articulating how their actions contribute to positive health outcomes.

Statement of problem

In clinical practice, nurses are required to systematize patient care as to ensure patient safety and quality care (Paans, Sermeus, Nieweg, & Van der Schans, 2010; Saranto & Kinnunen, 2009). A key aspect of this process is that nursing records be kept in a comprehensive and proper fashion and especially, that this documentation be understood and valued. Within this context, the use of standardized terminology for nursing documentation has gained ground and helped enhance the quality of nursing records (Linch, Müller-Staub, & Rabelo, 2010).

In Nigeria, especially at the PHCs, nursing documentation is a routine practice but nurses rarely use standardized language for this purpose. Furthermore, 100% of nursing records are paper based. Since nurses are expected to describe, document nursing care to patients/clients and evaluate their contributions to the health care system, using standardized nursing terminology (NANDA-I, NIC, & NOC) within the health care system for documentation is critical for nurses to communicate their impact on patient care to the multidisciplinary team. The universal requirement for quality patient care, internal control, efficiency and cost containment, has made it imperative for nurses to document care adequately and consistently but this is not the case among nurses in Primary Health Centres.

In many countries, as well as in Nigeria, nursing documentation is part of the patient health care record and health laws require that the documentation of care and nursing treatments be adequate, complete, and of good quality. Patient's health problems that nurses address, the nursing interventions performed and the evaluation of the care given must be documented. Therefore, the nursing portion of the record is a means not only to document and compare, but also to ensure and improve the quality of nursing care. It is imperative to state that quality documentation is core to effective use of standardized nursing terminologies for quality nursing care. Regrettably, nurses have not been consistent in the use of appropriate nursing terminologies.

Objectives of the study

The specific objectives of this research are to

i. determine whether NNN was used for documentation of care at the maternal and infant/child welfare units of the selected PHCs.
ii. identify the NNN used for documentation of nursing care at the maternal and infant/child welfare units of the selected PHCs.

Research question

i. Are NNN used for documentation of nursing care at the maternal and infant/child welfare units of the selected PHCs?
ii. What are the NNN used for documentation of care at the maternal and infant/child welfare units of the selected PHCs?

Hypothesis

There is no significant difference in the NNN used for documentation of care between the maternal and infant/child welfare units of the selected PHCs.

Significance of the study

In a global and national sense, the significance of this study is to validate that NNN can be used by Public Health Nurses for documentation of care at the Primary Health Care settings. The findings of the study will provide information to Public Health Nurses, managers, and administrators in these facilities on the most effective way to document client care. It will provide data on the use of existing Standardized Nursing Languages (SNLs) and the development of new ones in nursing in Nigeria and globally.

Ultimately, through constant and continuous evaluation of PHNs' documentation using NNN across various health care settings, gaps in the documentation process will be discovered and necessary actions and corrections will be taken with immediate effect. This will help to improve quality of care rendered to clients and serve as a tool for evaluation of nursing care and practice. It will provide baseline data for further research.

Literature review

Standardized Nursing Language which is a current concept in nursing profession is the commonly accepted terminology used widely by nurses to describe the care given to patients. Rutherford (2008) observed that Keenan supplied a straight forward definition of a standardized nursing language as a common language readily understood by nurses to provide. In the same vein, the Association of Perioperative Registered Nurses (AORN) (2016) further explained that a standardized language provides nurses with a common means of communication. Similarly, Thede and Sewell (2012) defined a standardized terminology as a list of terms with agreed upon definitions so that when a term is used it means the same thing to everyone.

According to Olaogun and Adejumo (2014), Standardized Nursing Language is defined as content standards that include terms which a focus of health (diagnoses), interventions and outcomes consistent with the scope of nursing practice. Rutherford (2008) opined that Standardized Nursing Languages describe nursing care concepts such as diagnoses, interventions and outcomes using common terms to communicate within and across health care systems, health care providers, and other health professionals. Documentation using NANDA-I, NIC & NOC is very important and cannot be over-emphasized. Aquillino and Keenan (2001) asserted that the aims of the movement of nursing documentation towards standardized nursing language is to improve nurses' communication with other healthcare providers, promote continuity of patient care and provide data that can support the credibility and visibility of the profession. This style of documentation would give precision to what nurses do, capture patient data more efficiently, thus benefiting both patients and researchers.

It is widely known that nursing documentation contains the record of provided care to the patients admitted to different hospital wards. The goal of this record is to empower health-care systems through standardized patient care. Proper documentation is a fundamental component of patient care

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because it facilitates communication between physicians, nurses, and other health-care providers, which is a key element in quality care (Wang, Hailey & Yu, 2011; College & Association of Registered Nurses of Alberta, 2013).

Documenting executed tasks is also considered an integral component of the so-called "nursing process". The nursing process is a recognized scientific method for patient-oriented care that comprised of six phases: 1) patient/client assessment; 2) primary nursing diagnosis; 3) outcome/goal identification; 4) planning to achieve goals; 5) implementing defined plans and documenting the process; and 6) evaluation of nursing care.

To achieve high standards of clinical medicine and nursing, it is imperative that the process of

documentation is done consistently and properly among health-care providers, yet setting up a system to do so remains a constant challenge. Shortcomings in the documentation of nursing care results in ineffective service provision; for this reason, standard tools to evaluate patient records are utilized among nursing teams and managers; these measures are important in providing high-quality service in any medical setting. Additionally, nursing reports are the only viable legal record of the executed tasks and the best evidence to be offered in cases of negligence complaints.

Furthermore, NANDA-I, NIC & NOC address only one of the three nursing elements needed for full planning and documentation. To provide terminology to document nursing problems, interventions, and outcomes it is necessary for NANDA-I, NIC, & NOC to be used together.

Johnson (2006) posited that NNN linkages are structured NANDA-I nursing diagnoses with a list of recommended or possible NOC outcomes, and a list of recommended NIC interventions to meet the selected outcome of the diagnosis. They are as well used for the development of care plans for individuals, family and community. Several intervention studies have been conducted on the use of NANDA-I, NIC & NOC for documentation of care nationally and internationally through education and training of nurses using diverse patient populations and facilities. Abreu (2006) conducted a study on the NANDA-I, NIC & NOC linkages by the nurses in the care of orthopaedic patients in a Brazilian University hospital. The linkages were for three nursing diagnoses (153 patients presented with a Bathing/Hygiene Self Care Deficit; 134 patients had Impaired Physical Mobility; 128 patients had Risk for Infection) with patients undergoing Total Hip Replacement procedures. He found out that for the three most prevalent nursing diagnoses, fifty-two different nursing interventions were prescribed and the majority of them were mapped to interventions and activities contained in twenty-eight NIC interventions located in Physiological: Basic, Physiological: Complex, Behavioural, and Safety domains. In a study conducted by Hughes (2006) in Ireland, he identified and defined the problems, interventions, and outcomes of patients with spinal cord injury within the Irish Spinal Cord Injury Service with standardized terminologies using consensus-based approach. He further made comparisons between the acute and rehabilitation centres as well as with results of a similar study conducted previously in the United Kingdom. This gave way for further study on identification of common nursing terminologies among the spinal cord injury in Ireland and United Kingdom. In another study, the understandability, validity, and appropriateness of the determined nursing diagnoses, interventions and activities of each intervention, and outcomes were evaluated through a series of focus group meetings in a Burn unit in Turkey. In this study, the actual and potential nursing diagnoses leading to nursing interventions in the care of patients in the Burn unit were identified (Erdemir & Algier, 2006). To validate the necessity of NANDA-I, NIC, & NOC linkage, another study by Kautz (2006) found that NANDA-I nursing diagnoses, nursing interventions and nursing outcomes were appropriately linked and used to document patient/client care.

Yom (2002) conducted a study of the application of NANDA-I, NIC & NOC in the care of patients undergoing abdominal surgery in Korea and the result demonstrated the appropriate and effective use of nursing diagnoses, interventions, and outcomes.

Theoretical framework

Everett Rogers's Diffusion of Innovation (DOI) theory was selected as the theory on which this research work is based. This is because it provides the steps needed to know and successfully adopt an innovative change. According to Rogers (2003), Diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system. Given that

decisions are not authoritative or collective, each member of the social system faces his/her own innovation-decision that follows a 5-step process. These include Knowledge – person becomes aware of an innovation and has some idea of how it functions; Persuasion - forms a favourable or unfavourable attitude toward the innovation; Decision – person engages in the activities that lead to a choice to adopt or reject the innovation; Implementation – person puts an innovation into use; Confirmation – person evaluates the results of an innovation-decision already made.

A measurement of the first two steps in the DOI theory, knowledge and persuasion (attitude) is essential to determine the practice of SNL in nursing documentation. One cannot assume that knowledge and a favourable attitude toward an innovation will lead to adoption. Gusen (2015) stated that there are some innovations which individuals are knowledgeable about and have a favourable attitude towards, but are not reflected in their practice. Rutherford (2008) identifies this as the "KAP-gap" (Knowledge-Attitude-Practice). Since the nurses in the selected facilities have been trained on the use of NNN for documentation of nursing care, evaluating the use of these SNLs will help to identify knowledge and practice gap in the use of standardized documentation by nurses. It is believed that the trained nurses know about documentation using NNN but may not have the resources to practice this type of documentation, or may not know how to document accurately. Evaluation of standardized documentation will help to determine ways and additional steps that may be needed to assist nurses to practice the innovation without confusion and stress.

Materials and methods

Research design: The study adopted a retrospective descriptive research design.

Location/area of the study: The setting of this research is Primary Health Centres at Ijebu Ode LGA. There are 11 Primary Health centres (PHCs) located at Ijebu Ode Local government Area. These are Odo esa PHC, Italapo PHC, Ita Osu PHC, Iwade Isale PHC, Iwade Oke PHC, Molipa PHC, Isiwo PHC, Oke Oyinbo PHC, Itamapako PHC, Isoku isado, Akintonde Arcade PHC. Within the Primary Health Care (PC) setting, community/public health nurses are the leaders in care delivery, striving to teach patients to take care of themselves. They provide services at the community level. Services available at these centres are Immunization services, Maternal & Child Health services such as Ante natal care, post natal care, family planning services, treatment of medical cases, Reproductive health services, School health services, child welfare services, etc. Investigation showed that common conditions handled by PHNs were malaria, malnutrition, gastroenteritis, respiratory tract infections, skin infections, pain, teenage pregnancies, ear infections, injuries and wounds, childbirth, diarrhea, fever, worm infestation, truancy at school, drug abuse and rape. Minor ailments are mostly treated but for severe conditions referrals are made. Sick people are also admitted and can be on admission ranging from a day to one week. Other personnel working in the primary health care centres include Registered nurses and midwives, doctor, Community Health Extension Workers, Junior Community Health Extension Workers, and health attendants etc.

Sampling technique/sample: Random sampling technique was used to select 5 PHCs among the 11 PHCs whose nurses had earlier been trained on the use of the Standardized nursing terminologies (NANDA-I, NIC & NOC) for documentation of care. The PHCs are Odo esa PHC, Italapo PHC, Ita Osu PHC, Oke Oyinbo PHC, & Iwade Isale PHC.

Instrument for data collection: All patient nursing care plan records documented using NANDA-I, NIC & NOC from January 1 to December 31 of the years 2014, 2015, and 2016 at the maternal and infant welfare units was utilized for data collection. A total of 180 care plans were collected and used to get data for the study.

Method of Data Collection/Analysis: Data from the paper-based standard nursing care plans with NANDA-I, NIC & NOC was collected. Data was analyzed using the Statistical Package for Social Sciences (SPSS) version 17.0 for both descriptive and inferential statistics. Descriptive statistics such as frequencies and percentages were used to present summary tables while hypothesis generated was tested using T-test.

Ethical Consideration: Written permission was obtained from the Research Ethics Committee of Ministry of Health, Abeokuta, Ogun State to conduct the study in the selected Primary health centres. Permission was also taken from appropriate authorities such as the PHC Coordinator and Chief

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Nursing Officers in charge of the facilities. Consent was obtained from the nurses to use the care plans of the patients. Information got from these records was kept confidential and used for research purpose only.

Results of the study

Table 1. NANDA-I used by PHNs at the Maternal Health Units of the selected PHCs

NANDA I	Frequency	%	Cum Freq	Cum %
Hyperthermia	30	16.6	30	16.6
Infection	10	5.5	40	22.1
Activity Intolerance	5	2.7	45	24.8
Breastfeeding Ineffective	11	6.1	56	30.9
Insomnia	11	6.1	67	37.0
Nausea & vomiting	15	8.3	82	45.3
Acute pain	13	7.2	95	52.5
Imbalanced nutrition less than body requirement	12	6.6	107	59.1
Breastfeeding Interrupted	5	2.7	112	61.8
Anxiety	7	3.8	119	65.6
Diarrhoea	6	3.3	125	68.9
Constipation	7	3.8	132	72.7
Fluid volume deficit	15	8.3	147	81.0
Non-compliance	4	2.2	151	83.2
Tissue integrity impaired	9	5.0	160	88.5
Fatigue	6	3.3	166	91.8
Knowledge deficit	14	7.7	180	99.5

The above table shows the NANDA-I nursing diagnoses used by the PHNs at the Maternal Health Units in the care of women and mothers attending the centres for services such as Antenatal Care, Intrapartal Care, Postnatal Care, Medical Care, etc. From the table, seventeen nursing diagnoses were used by the PHNs for documentation of nursing care. The most frequently used nursing diagnoses were Hyperthermia (16.6%), Fluid volume deficit (8.3%), Nausea & vomiting (8.3%), knowledge deficit (7.7%), Acute pain (7.2%), Imbalanced nutrition less than body requirement (6.6%), etc.

Table 2. NOCs used by PHNs at the Maternal Health Units of the selected PHCs

NOC	Frequency	%	Cum freq.	Cum %
Knowledge: Pregnancy	1	0.5	1	0.5
Knowledge: Preconception maternal health	1	0.5	2	1.0
Knowledge: Labour & delivery	1	0.5	3	1.5
Knowledge: Postpartum maternal health	1	0.5	4	2.0
Knowledge: Infant care	1	0.5	5	2.5
Knowledge: Diet	2	1.0	7	3.5
Knowledge: Treatment regimen	1	0.5	8	4.0
Pain control	8	4.1	16	8.1
Pain level	3	1.5	19	9.6
Appetite	3	1.5	22	11.1
Nausea & vomiting control	12	6.1	34	17.2
Compliance Behaviour: Prescribed diet	3	1.5	37	18.7
Compliance: Prescribed medication	5	2.5	42	21.2

Maternal status: Antepartum	3	1.5	45	22.7
Maternal status: Intrapartum	3	1.5	48	24.2
Comfort status	5	2.5	53	26.7
Fatigue level	4	2.0	57	28.7
Sleep	8	4.1	65	32.8
Electrolyte balance	5	2.5	70	35.3
Fluid balance	15	7.7	85	43.0
Bowel elimination	5	2.5	90	45.5
Wound healing	4	2.0	94	47.5
Immune status	5	2.5	99	50.0
Activity tolerance	5	2.5	104	52.5
Hydration	5	2.5	109	55.0
Thermoregulation	25	12.8	134	67.8
Vital signs	10	5.1	144	72.9
Nutritional status: Food & Fluid intake	12	6.1	156	79.0
Breastfeeding establishment maternal	4	2.0	160	81.0
Knowledge: Breastfeeding	4	2.0	164	83.0
Tissue integrity: Skin & mucous membrane	4	2.0	168	85.0
Electrolyte monitoring	2	1.0	170	86.0
Parent-Infant attachment	4	2.0	174	88.0
Energy conservation	2	1.0	176	89.0
Weight management	3	1.5	179	90.5
Breastfeeding maintenance	5	2.5	184	93.0
Risk control	7	3.6	191	96.6
Knowledge: Medication	1	0.5	192	97.1
Knowledge: Weight management	1	0.5	193	97.6
Knowledge: Energy conservation	1	0.5	194	98.1
Knowledge: Health promotion	1	0.5	195	98.6
Knowledge: Pregnancy & post partum sexual functioning	1	0.5	196	99.1

The above table reflects the NOCs used by the PHNs at the Maternal Health Units. The most frequently used NOC were Thermoregulation (12.8%), Fluid balance (7.7%), Nausea & vomiting (6.1%), Nutritional status: Food & Fluid intake (6.1%), Vital signs (5.1%), etc.

Table 3. NICs used by PHNs at the Maternal Health Units of the selected PHCs

NIC	Frequency	%	Cum Freq.	Cum %
Health Education	8	3.6	8	3.6
Teaching: Prescribed Activity/Exercise	7	3.1	15	6.7
Analgesic Administration	15	6.7	30	13.4
Teaching: Prescribed medication	9	4.0	39	17.4
Vital signs monitoring	15	6.7	54	24.1
Pain management	5	2.2	59	26.3
Medical management	8	3.6	67	29.9
Infection protection	5	2.2	72	32.1
Wound care	5	2.2	77	34.3
Suturing	8	3.6	85	37.9

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Lactation counseling	4	1.8	89	39.7
Anxiety reduction	5	2.2	94	41.9
Childbirth preparation	5	2.2	99	44.1
Preconception counseling	6	2.7	105	46.8
Vomiting management	13	5.8	118	52.6
Nausea management	10	4.5	128	57.1
Fluid management	9	4.0	137	61.1
Bowel management	6	2.7	143	63.8
Nutritional counseling	15	6.7	158	70.5
Constipation/impaction management	7	3.1	165	73.6
Incision site care	5	2.2	170	75.8
Calming technique	4	1.8	174	77.6
Nutrition management	4	1.8	178	79.4
Sleep enhancement	8	3.6	186	83.0
Activity therapy	5	2.2	191	85.2
Fluid monitoring	6	2.7	197	87.9
Prenatal care	6	2.7	203	90.6
Attachment promotion	4	1.8	207	92.4
Parent education: Infant care	5	2.2	212	94.6
Birthing Intrapartal care	2	0.9	214	95.5
Post partal care	2	0.9	216	96.4
Teaching: Environmental management	2	0.9	218	97.3
Infection control	5	2.2	223	99.5

The above table reflects the NIC used by the PHNs in the care of women and mother attending the centres. The most frequently used NIC include Analgesic administration (6.7%), Nutritional counseling (6.7%), vital signs monitoring (6.7%), vomiting management (5.8%), Nausea management (4.5%), etc.

Table 4. NANDA-I used by PHNs at the Infant/Child Health Units of the selected PHCs

NANDA I	Frequency	%	Cum Freq.	Cum %
Hyperthermia	45	19.2	45	19.2
Infection	35	14.9	80	34.1
Infection, risk for	5	2.1	85	36.2
Ineffective infant feeding pattern	7	2.9	92	39.1
Insomnia	8	3.4	100	42.5
Nausea & vomiting	10	4.3	110	46.8
Acute pain	15	6.4	125	53.2
Imbalanced nutrition less than body requirement	25	10.7	150	63.9
Imbalanced nutrition more than body requirement	5	2.1	155	66.0
Risk for Aspiration	3	1.3	158	67.3
Diarrhoea	12	5.1	170	72.4
Constipation	8	3.4	178	75.8
Fluid volume deficit	13	5.6	191	81.4
Injury	14	5.9	205	87.3
Tissue integrity impaired	11	4.7	216	92.0
Hypothermia	4	1.7	220	93.7
Oral mucous membrane impaired	14	5.9	234	99.6

The above table shows the NANDA I nursing diagnoses used by PHNs in the care of infants and children that are brought by their mothers, caregivers, or significant others for medical attention or childhood illnesses. The most frequently used NANDA-I nursing diagnoses include Hyperthermia (19.2%), Infection (14.9%), Imbalanced nutrition less than body requirement (10.7%), Acute pain (6.4%), Injury (5.9%), Oral mucous membrane impaired (5.9%), Fluid volume deficit (5.6%), Diarrhoea (5.1%), etc.

Table 5. NOCs used by PHNs at the Infant/Child Health Units of the selected PHCs

NOC	Frequency	%	Cum Freq.	Cum %
Thermoregulation	25	10.7	25	10.7
Vital signs	10	4.3	35	15.0
Nutritional status: Food & Fluid intake	34	14.5	69	29.5
Fluid balance	7	2.9	76	32.4
Hydration	11	4.7	87	37.1
Comfort status	2	0.9	89	38.0
Pain control	8	3.4	97	41.4
Pain level	5	2.1	102	43.5
Bowel elimination	8	3.4	110	46.9
Immunization behavior	5	2.1	115	49.0
Immune status	10	4.3	125	53.3
Sleep	8	3.4	133	56.7
Infection control	20	8.5	153	65.2
Risk control	8	3.4	161	68.6
Breastfeeding establishment: Infant	4	1.7	165	70.3
Newborn monitoring	5	2.1	170	72.4
Symptom severity	5	2.1	175	74.5
Nausea & vomiting control	10	4.3	185	78.8
Wound healing	25	10.7	210	89.5
Breastfeeding maintenance	3	1.3	213	90.8
Gastrointestinal function	7	2.9	220	93.7
Oral hygiene	14	5.9	234	99.6

The above table shows the NOC used by the PHNs at the Infant/Child Health Units. The most frequently used NOC were Nutritional status: Food & Fluid intake (14.5%), Thermoregulation (10.7%), Wound healing (10.7%), Infection control (8.5%), Oral hygiene (5.9%), Hydration (4.7%), Nausea & vomiting control (4.3%), Vital signs (4.3%), Immune status (4.3%), etc.

Table 6. NICs used by PHNs at the infant/child health units of the selected PHCs

NIC	Frequency	%	Cum Freq.	Cum %
Vital signs monitoring	10	4.3	10	4.3
Analgesic administration	25	10.7	35	15.0
Nutrition management	30	12.8	65	27.8
Fluid monitoring	7	2.9	72	30.7
Constipation management	8	3.4	80	34.1
Fluid management	6	2.6	86	36.7
Medication management	10	4.3	96	41.0
Cord/wound care	25	10.7	121	51.7
Infection protection	35	14.9	156	66.6
Vomiting management	7	2.9	163	69.5
Attachment promotion	12	5.1	175	74.6
Pain management	15	6.4	190	81.0

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Bowel management	12	5.1	202	86.1
Nausea management	10	4.3	212	90.4
Sleep enhancement	8	3.4	220	93.8
Oral health restoration	14	5.9	234	99.7

The above table reflects the NIC used by PHNs at the Infant/ Child Welfare units. The most frequently used NIC include Infection protection (14.9%), Nutrition management (12.8%), Analgesic administration (10.7%), Cord/wound care (10.7%), Pain management (6.4%), Oral health restoration (5.9%), Attachment promotion (5.1%), Bowel management (5.15), etc.

Result of hypothesis

Hypothesis (H_O): There is no significant difference in the NNN used for documentation at the maternal and infant/child welfare units of the selected PHCs.

T- test Result on mean score of PHNs' documentation of care using NNN between the Maternal and Infant Health Units

Unit	Mean/SD	Df	t calculated value	t critical value
Maternal Unit	23.45±2.37	19	-1.00	1.96
Infant Unit	24.14± 4.23			

$P < 0.05$

The above table showed that the t calculated value of -1.00 is lesser than the critical value of 1.96, which was not significant at 0.05 alpha levels. The finding revealed that there is no significant difference in the NNN used for documentation of care between PHNs at the maternal and infant health care units of the selected PHCs. Therefore, the null hypothesis postulated was accepted.

Discussion of results

The study revealed that NNN was used by the PHNs to document care given to clients/patients at the maternal and infant welfare units of the selected PHCs. Tables 1 to 6 shows the NNN used for documentation of care at the maternal and infant/child health care units. The NANDA-I nursing diagnoses used at the maternal unit include Hyperthermia (16.6%), Fluid volume deficit (8.3%), Nausea & vomiting (8.3%), knowledge deficit (7.7%), Acute pain (7.2%), Imbalanced nutrition less than body requirement (6.6%), and so on. The NOCs used at the maternal unit were Thermoregulation (12.8%), Fluid balance (7.7%), Nausea & vomiting (6.1%), Nutritional status: Food & Fluid intake (6.1%), Vital signs (5.1%), etc. The NICs used at the maternal unit include Analgesic administration (6.7%), Nutritional counseling (6.7%), vital signs monitoring (6.7%), vomiting management (5.8%), Nausea management (4.5%), etc.

The NANDA-I nursing diagnoses used at the Infant health care unit include Hyperthermia (19.2%), Infection (14.9%), Imbalanced nutrition less than body requirement (10.7%), Acute pain (6.4%), Injury (5.9%), Oral mucous membrane impaired (5.9%), Fluid volume deficit (5.6%), Diarrhoea (5.1%), etc. The NOCs used at the infant health care unit include Nutritional status: Food & Fluid intake (14.5%), Thermoregulation (10.7%), Wound healing (10.7%), Infection control (8.5%), Oral hygiene (5.9%), Hydration (4.7%), Nausea & vomiting control (4.3%), Vital signs (4.3%), Immune status (4.3%), etc. The NICs used at the infant health care unit include Infection protection (14.9%), Nutrition management (12.8%), Analgesic administration (10.7%), Cord/wound care (10.7%), Pain management (6.4%), Oral health restoration (5.9%), Attachment promotion (5.1%), Bowel management (5.15), etc.

The results of this study are also related to the findings of several studies carried out by various researchers on the use of NNN for documentation of nursing care. In a study conducted by Hughes (2006) in Ireland, he identified and defined the problems, interventions, and outcomes of patients with spinal cord injury within the Irish Spinal Cord Injury Service with standardized terminologies using consensus-based approach. He further made comparisons between the acute and rehabilitation centres as well as with results of a similar study conducted previously in the United Kingdom. This gave way for further study on identification of common nursing terminologies among the spinal cord injury in Ireland and United Kingdom. In another study, the understandability, validity, and appropriateness of

the determined nursing diagnoses, interventions and activities of each intervention, and outcomes were evaluated through a series of focus group meetings in a Burn unit in Turkey. The result showed that the actual and potential nursing diagnoses leading to nursing interventions in the care of patients in the Burn unit were identified (Erdemir & Algier, 2006).

Larrabee, et al. (2001) reported on the evaluation of documentation before and after the introduction of a nursing information system, using standardized NANDA-I, NIC and NOC diagnoses, interventions, and outcomes. A statistically significant improvement in the specification and achievement of nursing outcomes and implementation of nursing interventions was found. A longitudinal, comparative quasi-experimental study showed a statistically significant, qualitative improvement of nursing interventions and outcomes after training nurses in assessment, diagnosing, planning, implementing and evaluation, using coherence as a quality indicator. Mean scores for the documentation of nursing history, diagnoses, expected outcomes, planned interventions and outcomes attained rose statistically significant after training and at three years later, indicating the improvement persisted over time (Bjoervell et al., 2002). Nahm & Poston (2000) also found a statistically significant increase in the quality of the documentation after introduction of standardized diagnoses and interventions in nursing documentation.

Conclusion/Recommendations

The study evaluated and critically analyzed the adequacy and quality of PHNs' documentation of care using NNN at the maternal and infant welfare units at selected PHCs. The study has demonstrated that NNN can be used for documentation of care as well as appropriately linked at the PHCs and not only at the Tertiary and secondary health facilities.

The study has also compared the adequacy and quality of PHNs' documentation of care at PHCs. Most studies carried out on NNN for documentation in Nigeria had been focused on tertiary and secondary facilities.

Based on the findings of the study, the following recommendations are made:

(a) It is crucial to implement and constantly support nurses to practice critical thinking and clinical reflection

(b) After the training on NNN, nurses must be supported regularly both in the correct use and application of NNN for documentation

(c) Influencing factors and barriers in the use of nursing documentation are to be analyzed and evaluated regularly

(d) The use and documentation quality of the NNN nursing process should be evaluated periodically, and corresponding feedbacks should be given to clinical nurses.

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