Use of the North American Nursing Diagnosis Association taxonomies, Nursing Intervention Classification, Nursing Outcomes Classification and NANDA-NIC-NOC linkage in cardiac rehabilitation

Anna Maria Iannicelli[1*], Pasquale De Matteo[2*], Daniele Vito[1], Elisa Pellecchia[2], Concetta Dodaro[3], Francesco Giallauria[2], Carlo Vigorito[2]

[1]Department of Translational Medical Sciences, Federico II University of Naples; [2]Division of Internal Medicine (Metabolic and Cardiac Rehabilitation Unit), Federico II University of Naples; [3]Department of Advanced Biomedical Sciences, Federico II University of Naples, Italy; [*]These Authors equally contributed to the work.

Abstract

This study aims at creating a standardized language for each patient admitted to Cardiac Rehabilitation Unit (CR) by identifying nursing diagnosis, interventions, results/objectives expected and related correlations. The primary outcome was identifying health needs of all patients admitted to CR. The secondary outcomes were the identification of North American Nursing Diagnosis Association -International diagnoses (NANDA-I), of nursing intervention classification (NIC), of nursing outcomes classification (NOC) and their correlation NANDA-NIC-NOC linkage (NNN linkage) in order to define a standardized language for all nursing staff. This is a retrospective study involving a sample of 168 patients discharged from CR. The NANDA-I, the NIC, the NOC and the most frequently used NNN connections were identified and collected by using structured form including the 11 functional models of Marjory Gordon. Data from 76 patients were analyzed (92.1% male; mean age (± SD) 62.7±9 yrs; IQ range: 42-82). The main NANDA-I nursing diagnosis belongs to psychological sphere, but not to physiological domains. The statement NIC has allowed to put into practice actions of health prevention and education.

Nursing care documentation and NNN taxonomic language promotes a wide diffusion of nursing discipline culture and significant qualitative improvement of patient's care, further improving the communication between nurses and other health professionals.

Correspondence: Anna Maria Iannicelli, Department of Translational Medical Sciences, University of Naples Federico II, Via Pansini 5, 80131 Naples, Italy. Tel: + 39.081.746.4559 - Fax: + 39.081.746.4559. E-mail: annamaria.iannicelli@unina.it

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Introduction

Cardiac rehabilitation (CR) program exerts several beneficial effects reducing mortality [1,2], preventing cardiac remodeling [3,4], and improving cardiovascular functional capacity and myocardial perfusion [5-8]. The improvement of endothelial function [8], the anti-inflammatory properties [9,10], the improvement of neurohormonal and autonomic balance [11-18] might be at the basis of the mechanisms by which exercise training exerts its beneficial effects.

Standardized care terminology plays a key role in nursing care [19]. The knowledge of the basic concepts in nursing practice, of the nursing staff roles, of the care theories and legal problems, could improve nursing interventions and outcomes in different settings [20]. These standardized terminologies are necessary for the execution of nursing care plans, especially in case of use of nursing record [21]. Previous evidences suggest that the nursing record must include nursing diagnoses, interventions and outcomes to totally reflect the entire nursing process [22].

The aims of this study are to identify the health needs of patients, the identification of NANDA-International diagnoses (NANDA-I) [23]; of nursing intervention classification (NIC) [24]; of nursing outcomes classification (NOC) [25] and their correlation (NNN linkage), in order to define standardized language for all nursing staff [26]. In addition, the 11 functional models of Marjory Gordon have been used as functional model of global of global assessment of care assistance [27].

Patients and Methods

Data from patients admitted to the CR unit at the "Federico II" University of Naples were analyzed retrospectively. In this study were analyzed a total of 168 patients admitted from January 1, 2016 to December 31, 2016. The inclusion criteria defined were: 1. Medical diagnosis of previous acute myocardial infarction

(AMI) (ICD-9 412) or the presence of coronary angioplasty (ICD-9 V4582) or post-surgical status of aortocoronary by-pass (ICD-9 V4581); 2. No age limit; 3. No distinction of sex (Table 1). Exclusion criteria were defined as: 1. Patients with events following the previous IMA; 2. Not adherence to the trial; 3. Non-adhesion to cardiological rehabilitation (ICD-9 V612); 4. Patients who have performed less than 10 accesses to day-hospital and patients who have performed more than 50 accesses (Table 1). Subjects who met these criteria were included in the study constituting a sample of 76 [92.1% male; mean age (± SD) 65±12 yrs] patients out of a total of 168 patients in the entire population. Inclusion/exclusion criteria were ascertained by CR nurse team.

In overall population, the most detected ICD-9 codes are: (ICD-9 codes 2703/2720/2722/2750) Metabolism disorders detected 45 times; (25000/25002/25050) Diabetes mellitus 14 times; (27800/27801/27802) Overweight and obesity 7 times; (412) Previous myocardial infarction 76 times; (4110/4111/4149) Acute coronary syndrome 57 times; (4011/4019) Hypertension 35 times; (4280/4289) Congestive heart failure 13 times; (40210) Benign hypertensive heart disease 24 times; (41401) Coronary atherosclerosis of native coronary artery 24 times; (43310) Occlusion and stenosis of the carotid without mention of heart attack 23 times; (44020/44021/44381) Atherosclerosis of native arteries of the limbs and other peripheral angiopathies 11 times; (V4581/V4582) Post-surgical status of aorto-coronary bypass and angioplasty 56 times; (5560/5718/53051/53370/53510/56200/57420) Digestive system disorders 8 times and (60000/60090) Prostate disorders 13 times.

All clinical charts were evaluated with the use of a nursing record built for the specific study, structured with the Marjory Gordon' 11 functional models [27], and containing the NANDA-I taxonomy for the formulation of nursing diagnoses [23], the NOC taxonomy for the identification of outcomes and measurable result indicators [25], and the NIC taxonomy for the identification of nursing interventions and the respective activities [24].

Statistics

Descriptive statistics are given in terms of mean value ± standard deviation (SD). Comparison between variables were made using Student t-test. All data were collected in a specific database

Table 1. Gordon's functional models of health.

N.	Models	Data detected
1	Health perception and Management	• 5% of patient smoked before the event. • 60% of patients report drinking mild wine or alcohol (a glass at lunch in an interval of time from every day to once a week). • 18% of the patients did not carry out medical checks before the event. • The remaining 82% of patients practiced periodic checks and all adhered to prescribed medical treatment and all independently. • 4% of patients report being affected by allergies (drugs, dust, food, *etc.*).
2	Nutritional metabolic	• 4% of patients were obese and 18% overweight. • 18% are affected by diabetes mellitus. • 59% of patients are affected by metabolic disorders. • In addition, 14 patients report gastro-intestinal disorders.
3	Elimination	• 11.8% of patients report prostate problems with related urinary urination problems. • 2.6% of patients report kidney stones.
4	Activity exercise	• During exercise, 30% of the assisted patients report shortness of breath (walk, climb stairs, ride a bicycle) and 10% report breathlessness even at rest. • 25% report feeling tired and 15% feeling tired. • SpO_2 is altered in 8 patients for airway diseases and in patients with COPD.
5	Sleep rest	• A small proportion of patients, extrapolated from the total sample, claim to have awaken during sleep.
6	Cognitive-perceptual	• Two patients report hypoacusia. • Two patients report retinopathy/glaucoma. • Three patients have dementia with impaired intellectual functions. • 40% have difficulty making decisions.
7	Self perception/self concept	• Most patients have a correct perception of their physical as well as cognitive and emotional abilities. • 4% have a negative attitude towards their value, gender identity and their body image. • 78% report a sense of anxiety and restlessness (fear of a new event). • Signs of anxiety and fear are noticed in non-verbal signals in all patients. In particular, in some, from the eye contact, one notices discouragement and surrender.
8	Role relationship	• Most patients live in the family. • 40% are workers, 40% are retired, 20% has not declared status. • 20% of the assisted persons also refer to a family member (caregiver) in the communication between the health-patient. • 100% have positive interaction with health personnel.
9	Sexuality reproductive	• 13% of those assisted express concern about their sexuality after the event.
10	Coping-stress tolerance	• 90% showed functional adaptability to situations and habitual behavior in dealing with any problem. • 40% showed ability to use problem solving. • Most patients needed psychological support for anxiety/depression management.
11	Value-belief pattern	• Nobody has declared information about life and spiritual values and convictions.

and all analyses were conducted by using SPSS, version 25.0 for Windows (SPSS Inc., Chicago, IL, USA).

Results

Data from clinical records of 76 patients were analyzed [92.1% males; mean age (± SD) 65±12 years]. Table 1 shows Gordon's functional models of health detected. The frequencies of NANDA-I, NIC, NOC and NNN-linkage were also reported:

North American Nursing Diagnosis Association - International (NANDA-I)

NANDA-I nursing diagnoses detected in the 76 patients enrolled (n=460) are described and subdivided into domains and classes (Table 2). The most relevant nursing diagnoses belong to the domains:

- Domain 2: Nutrition (18.3%);
- Domain 4: Activities and rest (21.5%);
- Domain 9: Coping tolerance to stress (25.4%);
- Domain 11: Security/Protection (16.1%).

In detail, the most frequently NANDA-I nursing diagnoses identified were "anxiety" (00146), that was detected in 78.9% of subjects, followed by "availability to improve feeding" (00163) reported in 73.7% of cases 68%), and "impaired physical mobility" (00085), that was detected in 38.2% of patients.

Nursing Outcomes Classification (NOC)

The most frequently outcomes (NOCs) selected (n=1381) are reported in Table 3 and they belong to the following domains:

- Domain 2: Physiological health (35%);
- Domain 3: Psychosocial health (27.9%);
- Domain 4: Knowledge related to health and behavior (17.4%).

The main reported NOC is the "coping" (1302), detected 84 times, the second was the "self-control of fear" (1404), that was collected 77 times. Instead, the "nutritional status" (1004) and the "weight control" (1612) were detected 68 times.

Nursing intervention classification (NIC)

The detected interventions (NICs) (n=1708) are provided in Table 4. They are subdivided in the following domains:

- Domain 1: Basic Physiological (31.8%);
- Domain 2: Complex physiological (15.8%)

Table 2. NANDA-I diagnoses.

Domain (%)	Class	Nursing diagnosis	N	%
Health promotion(2.60%)	Health management	Frail elderly syndrome (00257)	5	1.1
		Ineffective health maintenance (00099)	3	0.7
		Risk-prone health behavior (00188)	4	0.9
Nutrition(18.26%)	Ingestion	Readiness for enhanced nutrition (00163)	56	12.2
		Obesity (00232)	6	1.3
		Overweight (00233)	1	0.2
		Risk for overweight (00234)	5	1.1
	Metabolism	Risk for unstable blood glucose level (00179)	16	3.5
Elimination and exchange (0.86%)	Respiratory function	Impaired gas exchange (00030)	4	0.9
Activity/rest(21.52%)	Sleep/Rest	Disturbed sleep pattern (00198)	1	0.2
	Activity/Exercise	Impaired physical mobility (00085)	29	6.3
	Energy balance	Fatigue (00093)	5	1.1
	Cardiovascular/Pulmonary responses	Decresed cardiac output (00029)	16	3.5
		Risk for decresed cardiac output (00240)	18	3.9
		Activity intolerance (00092)	7	1.5
		Ineffective peripheral tissue perfusion (00204)	5	1.1
		Risk for Ineffective peripheral tissue perfusion (00228)	18	3.9
Self -perception (7.82 %)	Self-concept	Readiness for enhanced hope (00185)	13	2.8
	Self-esteem	Risk for situational low self-esteem (00153)	13	2.8
	Body image	Disturbed body image (00118)	10	2.2
Role relationship (0.83%)	Caregiving role	Caregiver role strain (00061)	3	0.7
	Role performance	Impaired social interaction (00052)	1	0.2
Coping/Stress Tolerance (25.43%)	Coping response	Fear (00148)	17	3.7
		Anxiety (00146)	60	13.0
		Defensive coping (00071)	23	5.0
		Compromised family coping (00074)	16	3.5
		Chronic sorrow (00137)	1	0.2
Life principles (1.74%)	Value/belief/action congruence	Decisional conflict (00083)	8	1.7
Safety/protection (16.08%)	Infection	Risk for infection (00004)	14	3.0
	Physical injury	Risk for injury (00035)	23	5.0
		Risk for corneal injury (00245)	2	0.4
		Impaired tissue integrity (00044)	14	3.0
		Risk for urinary tract injury (00250)	17	3.7
		Risk for peripheral neurovascular dysfunction (00086)	4	0.9
Comfort (4.78%)	Physical comfort	Impaired comfort (00214)	22	4.8
Total			460	100

Table 3. NOC label.

Domain (%)	Classes	Outcomes	N	%
Functional health (13.7%)	Energy maintenance	Endurance (0001)	51	3.7
		Energy conservation (0002)	5	0.4
		Rest (0003)	1	0.1
		Sleep (0004)	1	0.1
		Activity tolerance (0005)	44	3.2
	Mobility	Ambulation (0200)	29	2.1
		Joint movement (0206)	29	2.1
		Mobility (0208)	29	2.1
		Skeletal function (0211)	1	0.1
Physiological health (35 %)	Cardiopulmonary	Cardiac pump effectiveness (0400)	34	2.5
		Circulation status (0401)	39	2.8
		Respiratory status: Gas Exchange (0402)	4	0.3
		Respiratory status: Ventilation (0403)	4	0.3
		Tissue perfusion: cardiac (0405)	39	2.8
		Tissue perfusion: peripheral (0407)	41	3.0
	Fluid and electrolytes	Electrolyte and acid/base balance (0600)	13	0.9
		Fluid balance (0601)	30	2.2
		Hydration (0602)	30	2.2
		Fluid overload severity (0603)	39	2.8
	Immune response	Immune status (0702)	14	1
	Neurocognitive	Decision-making (0906)	21	1.5
		Information processing (0907)	8	0.6
	Digestion and nutrition	Nutritional status (1004)	68	4.9
	Therapeutic response	Blood glucose level (2300)	16	1.2
	Tissue integrity	Tissue integrity: skin and mucous membranes (1101)	41	3.0
	Sensory function	Sensory Function: cutaneous (2400)	40	2.9
		Sensory Function: vision (2404)	2	0.1
Psychosocial health (27.9%)	Psychological well-being	Body image (1200)	10	0.7
		Mood equilibrium (1204)	1	0.1
		Self-esteem (1205)	46	3.3
		Depression level (1208)	1	0.1
		Fear level (1210)	17	1.2
		Anxiety level (1211)	60	4.3
	Psychosocial adaption	Acceptance: health status (1300)	1	0.1
		Coping (1302)	84	6.1
		Grief resolution (1304)	23	1.7
		Psychosocial adjustment: life change (1305)	23	1.7
	Self-control	Anxiety self-control (1402)	17	1.2
		Fear self-control (1404)	77	5.6
	Social interaction	Social interaction skills (1502)	24	1.7
		Social involvement (1503)	1	0.1
Knowledge about health and behavior (17.4%)	Health related behaviors	Adherence behavior (1600)	20	1.4
		Health promoting behavior (1602)	5	0.4
		Health seeking behavior (1603)	3	0.2
		Participation in health care decision (1606)	11	0.8
		Symptom control (1608)	26	1.9
		Treatment behavior: illness or injury (1609)	4	0.3
		Vision compensation behavior (1611)	2	0.1
		Weight control (1612)	68	4.9
		Diabetes self-management (1619)	16	1.2
	Beliefs related health	Health beliefs (1700)	4	0.3
	Knowledge related health	Knowledge: health resources (1806)	3	0.2
	Risk and security control	Risk control (1902)	23	1.7
		Risk detection (1908)	3	0.2
		Fall prevention behavior (1909)	29	2.1
		Safe home environment (1910)	23	1.7
Family health (6%)	Family caregiver	Caregiver lifestyle disruption (2203)	3	0.2
		Caregiver role support (2210)	3	0.2
	Health status of a family member	Caregiver emotional health (2506)	3	0.2
		Caregiver well-being (2508)	3	0.2
	Family well-being	Family coping (2600)	19	1.4
		Family functioning (2602)	17	1.2
		Family integrity (2603)	19	1.4
		Family normalization (2604)	16	1.2
Total			1381	100

- Domain 3: Behavior (40.3%);
- Domain 4: Security (12.1%).

In particular, the main NIC was "Exercise promotion" (0200) that appeared 104 times, the second was "anxiety reduction" (5820), detected 85 times and the third is "nutrition management" (1100) reported 84 times.

NNN linkage

According with the results previously reported, in Table 5 is shown the number of "NNN linkages" for the main NANDA-I diagnoses. It should be highlighted that even if the sample analyzed was composed of 76 subjects, some interventions exceed the sample number; this happens because NICs are interventions that apply to the individual NOC and not to the single subject. For example, the NIC "Promotion of physical activity" appeared 104 times, every time that an objective has as intervention the promotion of physical activity; similar results were observed for all other NIC selected and analyzed.

Discussion

The use of standardized terminology, applied to nursing charts, retrieves and facilitates the Evidence Based Nursing [28]. The analysis of the data collected from Gordon's functional models allowed the evaluation and the enunciation of nursing diagnoses; the evaluation and analysis of the objectives that must be achieved and the evaluation and execution of interventions useful for achieving the pre-established objectives.

The first data that emerges clearly and strongly is the *state of concern* that patient's experience. This status, plus the apprehension of cohabiting family members, creates a situation of tension, which must be managed at best. Thus, it is important to inform both the patient and the caregiver about the state of health and the rehabilitation process of the patient, to reassure everyone and to start an adequate health education. In this way, the caregivers will give they will give the right support to the person by becoming the managers of the care of their loved ones. Then, it could be justified the reason why the most relevant NANDA-I diagnoses belong to the psychological sphere and not to the physiological domains.

Anxiety (00146), *defensive coping* (00071), *impaired well-being* (00214) are the most frequent diagnoses in the analyzed cohort, and to these have been linked the more appropriate NOCs and NICs have been linked.

In cardiology setting, Park *et al.* [29] analyzed 272 patients diagnosed with acute heart failure to determine nursing diagnoses, the results to be followed and the interventions to be implemented. Authors reported the following nursing diagnoses: knowledge deficit (00126), reduced cardiac output (0029), risk of injury (00035) and inefficient airway release (00031). These four nursing diagnoses represented the 50% of the total of nursing diagnoses described in the study. In addition, the same study expressed as predominant domains *security/protection* domain (27.8%), *activity/rest* (22.8%), *perception/cognition* (15.7%) and *elimination and exchange* (12.6%); the most used classes were *cardiovascular/pulmonary* responses (21.9%), *physical injuries* (17.1%) and *cognition* (15%); while domains like *coping/stress tolerance* and *health promotion* have been poorly mentioned [29].

Moreover, Chiappinotto *et al.* [30] analyzed data on a cohort of 20 patients with a diagnosis of post-acute heart failure founding further nursing diagnoses: anxiety (00146), compromised well-being (00214) and intolerance to activity (00092). In a retrospec-

Table 4. NIC label.

Domain (%)	Classes	Intervention	N	%
Physiological: basic (32%)	Activity and exercise management	Body mechanics promotion (0140)	39	2.2
		Energy management (0180)	56	3.1
		Exercise promotion (0200)	104	5.7
		Exercise promotion: strength training (0201)	41	2.3
		Exercise therapy: ambulation (0221)	29	1.6
		Exercise therapy: joint mobility (0224)	29	1.6
	Elimination management	Urinary elimination management (0590)	17	0.9
	Immobility management	Positioning (0840)	70	3.9
	Nutrition support	Eating disorders management (1030)	16	0.9
		Nutrition management (1100)	84	4.6
		Nutritional management (1160)	56	3.1
		Weight management (1260)	12	0.7
		Weight reduction assistance (1280)	3	0.2
	Self-care facilitation	Eye care (1650)	2	0.1
		Sleep enhancement (1850)	13	0.7
Physiological: complex (15%)	Electrolyte and acid-base management	Fluid/electrolyte management (2080)	17	0.9
		Hyperglycemia management (2120)	16	0.9
	Drug management	Medication administration: oral (2304)	16	0.9
		Medication administration: subcutaneous (2317)	16	0.9
		Medication management (2380)	29	1.6
	Neurologic management	Peripheral sensation management (2660)	41	2.3
	Respiratory management	Airway management (3140)	4	0.2
		Airway insertion and stabilization (3210)	4	0.2
		Respiratory monitoring (3350)	4	0.2
	Skin/wound management	Wound care (3660)	14	0.8
	Tissue perfusion management	Cardiac care: rehabilitative (4046)	39	2.2
		Cardiac care: arterial insufficiency (4062)	41	2.3
		Cardiac care: venous insufficiency (4066)	41	2.3

To be continued on next page

tive study conducted in a small hospital in the northeast of Italy [31], the NANDA, NIC and NOC standard terminology have been applied to the nursing record in patients with chronic heart disease. Interestingly, Authors reported that nurses in Cardiac Rehabilitation care are aware of patient problems and are able to design a personalized care project. The main limitation is attention to physiological treatments; however, paying more attention to psychological problems and improvements in self-care may confer great improvement in nursing care. Furthermore, family and community care should be involved in patient's care more actively. In addition, NANDA-I, NOC and NIC taxonomies offer good coverage of cardiac rehabilitation nursing care, deemed of great utility as outlined by all cardiac nurses participating in rehabilitation care.

In the present study, all patients were affected from chronic or post-acute heart failure, and in these subjects the most common nursing diagnoses was *fear* (indicated 17 times), *anxiety* (60), *defensive coping* (23) and *compromising coping of the family* (16) of *the coping domain tolerance to stress* (25.4%). These results suggest that patients after an acute and sudden cardiovascular event had more anxiety and fear regarding the possible occurrence of a new future event. Therefore, cardiac patient tends to be more attentive to the symptoms that may occur and try to seek treatment strategies aimed to safeguarding the actual state of health.

The prescription of the CR can be explained through the NANDA-I diagnoses of *reduced cardiac output* (00029), *reduced cardiac output risk* (00240), *intolerance to activity* (00092), *ineffective perfusion of peripheral tissues* (00204) and *risk of ineffective perfusion of peripheral tissues* (00228), to which the NOC results and appropriate NIC interventions (listed in Table 5) have been linked. The more detected NICs are *exercise promotion* (0200) and *reduction of the anxiety* (5820). In addition, NICs of *counseling* (5240), a*ctive listening* (4920), *nutrition management* (1100) and *nutritional management* (1160) have been enunciated, translating into practice the works for prevention and health education.

Table 4. Continued from previous page.

Domain (%)	Classes	Intervention	N	%
Behavioral (40.3%)	Behavior therapy	Assertiveness training (4340)	24	1.3
		Behavior management (4350)	1	0.1
		Behavior modification (4360)	36	2.0
		Impulse control training (4370)	60	3.4
		Mutual goal setting (4410)	32	1.8
		Self-responsibility facilitation (4480)	8	0.4
	Cognitive therapy	Cognitive restructuring (4700)	13	0.7
	Communication enhancement	Active listening (4920)	47	2.6
		Socialization enhancement (5100)	10	0.6
	Coping assistance	Body image enhancement (5220)	10	0.6
		Coping enhancement (5230)	73	4.1
		Counseling (5240)	67	3.7
		Decision-making support (5250)	8	0.4
		Emotional support (5270)	23	1.3
		Grief work facilitation (5290)	10	0.6
		Presence (5340)	40	2.2
		Improvement of security (5380)	39	2.2
		Self-esteem enhancement (5400)	10	0.6
		Support group (5430)	23	1.3
		Support system enhancement (5440)	3	0.2
		Values clarification (5480)	8	0.4
	Patient education	Health education (5510)	21	1.2
		Learning facilitation (5520)	8	0.4
		Teaching: disease process (5602)	4	0.2
		Teaching: individual (5606)	1	0.1
		Teaching: prescribed activity/exercise (5612)	29	1.6
	Psychological comfort promotion	Anxiety reduction (5820)	85	4.8
		Relaxation therapy (6040)	18	1.0
Safety (7.2%)	Risk management	Area restriction (6420)	23	1.3
		Environmental management (6480)	13	0.7
		Fall prevention (6490)	29	1.6
		Health screening (6520)	3	0.2
		Infection control (6540)	14	0.8
		Risk identification (6610)	23	1.3
		Surveillance: safety (6654)	23	1.3
Family (3%)	Lifespan care	Caregiver support (7040)	3	0.2
		Family integrity Promotion (7100)	14	0.8
		Family mobilization (7120)	3	0.2
		Family support (7140)	14	0.8
		Family therapy (7150)	16	0.9
		Respite care (7260)	3	0.2
Health system (2.5%)	Health system mediation	Health system guidance (7400)	8	0.4
		Patient rights protection (7460)	8	0.4
	Information management	Referral (8100)	27	1.5
Total			1788	100

Table 5. NNN linkage.

NANDA-I		n	NOC		n	NIC		n
00257	Frail elderly syndrome	5	0005	Activity tolerance	5	0201	Exercise promotion: strength training	5
			0001	Endurance	5	0200	Exercise promotion	5
			0401	Circulation status	5	0180	Energy management	5
			0405	Tissue perfusion: cardiac	5	1850	Sleep enhancement	5
			0603	Fluid overload severity	5	4410	Mutual goal setting	5
						0140	Body mechanics promotion	5
						4046	Cardiac care: rehabilitative	5
						5380	Improvement of security	5
						6480	Environmental management	5
						5100	Socialization enhancement	5
00099	Ineffective health maintenance	3	1602	Health promoting behavior	3	5510	Health education	3
			1603	Health seeking behavior	3	4480	Self-responsibility facilitation	3
			1806	Knowledge: health resources	3	6520	Health screening	3
			1606	Participation in health care decision	3	1280	Weight reduction assistance	3
			1908	Risk detection	3			
00188	Risk-prone health behavior	4	1600	Adherence behavior	4	5510	Health education	4
			1700	Health beliefs	4	4410	Mutual goal setting	4
			1609	Treatment behavior: illness or injury	4	4480	Self-responsibility facilitation	4
			1608	Symptom control	4	5602	Teaching: disease process	4
00163	Readiness for enhanced nutrition	56	1004	Nutritional status	56	1100	Nutrition management	56
			1612	Weight control	56	1160	Nutritional management	56
00232	Obesity	6	1004	Nutritional status	6	1100	Nutrition management	6
			1612	Weight control	6	1260	Weight management	6
						5606	Teaching: individual	6
						4360	Behavior modification	6
						0200	Exercise promotion	6
00233	Overweight	1	1004	Nutritional status	1	1100	Nutrition management	1
			1612	Weight control	1	1260	Weight management	1
						5606	Teaching: individual	1
						4360	Behavior modification	1
						0200	Exercise promotion	1
00234	Risk for Overweight	5	1004	Nutritional status	5	1100	Nutrition management	5
			1602	Health promoting behavior	5	1260	Weight management	5
						5606	Teaching: individual	5
						4360	Behavior modification	5
						0200	Exercise promotion	5
00179	Risk for unstable bloof glucose level	16	2300	Blood glucose level	16	1030	Eating disorders management	16
			1600	Adherence behavior	16	1100	Nutrition management	16
			1619	Diabetes self-management	16	2120	Hyperglycemia management	16
						2304	Medication administration: oral	16
						2317	Medication administration: subcutaneous	16
						2380	Medication management	16
00030	Impaired gas exchange	4	0402	Respiratory status: gas exchange	4	0180	Energy management	4
			0403	Respiratory status: ventilation	4	0200	Exercise promotion	4
						3140	Airway management	4
						3210	Airway insertion and stabilization	4
						3350	Respiratory monitoring	4
00198	Disturbed sleep pattern	1	0003	Rest	1	0180	Energy management	1
			0004	Sleep	1	1850	Sleep enhancement	1
			0211	Skeletal function	1	6040	Relaxion therapy	1
						0200	Exercise promotion	1
						6480	Environmental management	1
00085	Impaired physical mobility	29	0200	Ambulation	29	0224	Exercise promotion: joint mobility	29
			0206	Joint movement	29	0201	Exercise promotion: strength training	29
			0208	Mobility	29	0221	Exercise promotion: ambulation	29
			1909	Fall prevention behavior	29	0840	Positioning	29
						5612	Teaching: prescribed exercise	29
						6490	Fall prevention	29
00093	Fatigue	5	0005	Activity tolerance	5	0180	Energy management	5
			0001	Endurance	5	6480	Environmental management	5
			0002	Energy conservation	5	4410	Mutual goal setting	5
						5100	Socialization enhancement	5

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Table 5. Continued from previous page.

NANDA-I		n	NOC		n	NIC		n
00029	Decreased cardiac output	16	0001	Endurance	16	0140	Body mechanics promotion	16
			0005	Activity tolerance	16	0180	Energy management	16
			0400	Cardiac pump effectiveness	16	0200	Exercise promotion	16
			0401	Circulation status	16	4046	Cardiac care: rehabilitative	16
			0405	Tissue perfusion: cardiac	16	5380	Improvement of security	16
			0603	Fluid overload severity	16			
00240	Risk for decreased cardiac output	18	0001	Endurance	18	0140	Body mechanics promotion	18
			0005	Activity tolerance	18	0180	Energy management	18
			0400	Cardiac pump effectiveness	18	0200	Exercise promotion	18
			0401	Circulation status	18	4046	Cardiac care: rehabilitative	18
			0405	Tissue perfusion: cardiac	18	5380	Improvement of security	18
			0603	Fluid overload severity	18			
00092	Activity intolerance	7	0005	Activity tolerance	7	0201	Exercise promotion: strength training	7
						0200	Exercise promotion	7
						0180	Energy management	7
						1850	Sleep enhancement	7
						4410	Mutual goal setting	7
00204	Ineffective peripheral tissue perfusion	5	2400	Sensori-function: tactile	5	2660	Peripheral sensation management	5
			1101	Tissue integrity: skin and membranes	5	4066	Cardiac care: venous insufficiency	5
			0407	Tissue perfusion: peripheral	5	4062	Cardiac care: arterial insufficiency	5
						0840	Positioning	5
						0200	Exercise promotion	5
00228	Risk for ineffective peripheral tissue perfusion	18	2400	Sensori-function: tactile	18	2660	Peripheral sensation management	18
			1101	Tissue integrity: skin and membranes	18	4066	Cardiac care: venous insufficiency	18
			0407	Tissue perfusion: peripheral	18	4062	Cardiac care: arterial insufficiency	18
						0840	Positioning	18
						0200	Exercise promotion	18
00185	Readiness for enhanced hope	13	0601	Fluid balance	13	2080	Fluid/electrolyte management	13
			0602	Hydration	13			
			0600	Electrolyte and acid/base balance	13			
00153	Risk for situational low self-esteem	13	0906	Decision making	13	4920	Active listening	13
			1304	Grief resolution	13	5340	Presence	13
			1305	Psychosocial adjustment: life change	13	5240	Counseling	13
			1205	Self-esteem	13	4700	Cognitive restructuring	13
						7140	Family support	13
						5430	Support group	13
						5230	Coping enhancement	13
00118	Disturbed body image	10	1200	Body image	10	5400	Self-esteem enhancement	10
			1304	Grief resolution	10	5240	Counseling	10
			1205	Self-esteem	10	5340	Presence	10
			1305	Psychosocial adjustment: life change	10	4920	Active listening	10
						5220	Body image enhancement	10
						5290	Grief work facilitation	10
						5430	Support group	10
						8100	Referral	10
00061	Caregiver role strain	3	2508	Caregiver well-being	3	7040	Caregiver support	3
			2203	Caregiver lifestyle disruption	3	7260	Respite care	3
			2506	Caregiver emotional health	3	5230	Coping enhancement	3
			2210	Caregiver role support	3	7120	Family mobilization	3
			2600	Family coping	3	4410	Mutual goal setting	3
			2603	Family integrity	3	5440	Support system enhancement	3
00052	Impaired social interaction	1	2602	Family functioning	1	4360	Behavior modification	1
			1502	Social interaction skills	1	7100	Family integrity promotion	1
			1503	Social involvement	1	5240	Counseling	1
						4350	Behavior management	1
						7140	Family support	1
						4480	Self-responsibility facilitation	1
00148	Fear	17	1402	Anxiety self-control	17	5820	Anxiety reduction	17
			1210	Fear level	17	5230	Coping enhancement	17
			1404	Fear self-control	17	5340	Presence	17
						5240	Counseling	17
						6040	Relaxion therapy	17

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Conclusions

This study showed that the use of a care planning created according to Marjory Gordon's model, and the NANDA, the NIC and NOC taxonomic language, applied to CR, is able to satisfy the health needs on the patient' physiological and psychosocial sphere. This is possible thanks to the safety, quality, and the constant and continue care of the nursing assistance to the patients. It should be emphasized that taking care of the person requires that the nurse must be fully present. The nurse could have the possibility to express their own in-depth scientific theoretical knowledge, critical thinking, clinical professional competence, and to independently evaluate the situation, in order to take the best decisions for the patient's safety and health, in full responsibility. Finally, a careful listening through a dialogue, allows to guarantee personalized assistance, able to carefully plan, manage and implement nursing interventions in line with the expected health results, reinforcing the attention to psychological, spiritual and emotional aspects in a logic of sharing the care plan with the patient. The use of an assistance documentation, of the NANDA, NIC and NOC taxonomies in CR setting, as well as improving communication between nurses

Table 5. Continued from previous page.

NANDA-I		n	NOC		n	NIC		n
00146	Anxiety	60	1211	Anxiety level	60	5820	Anxiety reduction	60
			1302	Coping	60	4370	Impulse control training	60
			1404	Fear self-control	60			
00071	Defensive coping	23	1302	Coping	23	5230	Coping enhancement	23
			1205	Self-esteem	23	5240	Counseling	23
			1502	Social interaction skills	23	5270	Emotional support	23
						4920	Active listening	23
						4340	Assertiveness training	23
						4360	Behavior modification	23
00074	Compromised family coping	16	2600	Family coping	16	5230	Coping enhancement	16
			2602	Family functioning	16	7100	Family integrity promotion	16
			2603	Family integrity	16	7150	Family therapy	16
			2604	Family normalization	16	5240	Counseling	16
						8100	Referral	16
00137	Chronic sorrow	1	1208	Depression level	1	5230	Coping enhancement	16
			1302	Coping	1	8100	Referral	1
			1204	Mood equilibrium	1	4920	Active listening	1
			1300	Acceptance: health status	1	4340	Assertiveness training	1
00083	Decisional conflict	8	0906	Decision making	8	5250	Decision making support	8
			0907	Information processing	8	4410	Mutual goal setting	8
			1606	Participation in health care decision	8	5520	Learning facilitation	8
						7400	Health system guidance	8
						7460	Patient rights protection	8
						5480	Values clarification	8
						5820	Anxiety reduction	8
00004	Risk for infection	14				6540	Infection control	14
			0702	Immune status	14	3660	Wound care	14
						5510	Health education	14
00035	Risk for injury	23	1910	Self-home environment	19	6420	Area restriction	19
			1902	Risk control	19	6654	Surveillance: safety	19
						6610	Risk identification	19
00245	Risk for corneal injury	2	1602	Health promoting behavior	2	6480	Environmental management	2
			1611	Vision compensation behavior	2	1650	Eye care	2
			2404	Sensori-function: vision	2			
00044	Impaired tissue integrity	14	2400	Sensori-function: tactile	14	2660	Peripheral sensation management	14
			1101	Tissue integrity: skin and membranes	14	4062	Cardiac care: arterial insufficiency	14
			0407	Tissue perfusion: peripheral	14	4066	Cardiac care: venous insufficiency	14
						0840	Positioning	14
						0200	Exercise promotion	14
00250	Risk for urinary tract injury	17	0601	Fluid balance	17	0590	Urinary elimination management	17
			0602	Hydration	17	2080	Fluid/electrolyte management	17
00086	Risk for peripheral neurovascular dysfunction	4	2400	Sensori function: tactile	4	2660	Peripheral sensation management	4
			1101	Tissue integrity: skin and membranes	4	4062	Cardiac care: arterial insufficiency	4
			0407	Tissue perfusion: peripheral	4	4066	Cardiac care: venous insufficiency	4
						0840	Positioning	4
						0200	Exercise promotion	4
00214	Impaired comfort	22	1608	Symptom control	22			

and other health professionals, promotes both the development of research and the dissemination of culture and nursing discipline, both the qualitative improvement of the assistance. In this way, the nurse could adopt different strategies for health management of each patient (education, counseling, cardiovascular risk modification, lifestyle modification) for reducing cardiovascular risks and preventing newer acute cardiovascular events.

In conclusion, nursing care documentation and NNN taxonomic language promotes a wide diffusion of nursing discipline culture and significant qualitative improvement of patient's care, further improving the communication between nurses and other health professionals.

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