O R I G I N A L   A R T I C L E :   N U R S I N G

Multi-dimensional nursing form: a novel means of approaching nurse-led secondary cardiology prevention

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Abstract. *Background and Aim:* Secondary prevention after an acute coronary syndrome (ACS) has proved to be effective in patients with coronary heart disease, and is strongly recommended by the international guidelines. However, there is a lack of widespread secondary preventive programmes in real-world clinical practice, even though it has been shown that these can be successfully conducted by nurses. *Method and Results:* We have designed a multicentre randomised trial involving patients with ACS in which nurses will fully coordinate secondary prevention in the intervention arm using a multidimensional nursing form after attending *ad hoc* teaching sessions.

Key words: multidimensional nursing form, narrative, acute coronary syndrome, secondary prevention

1. Introduction

1.1. Cardiovascular disease: risk factors and therapeutic compliance

Acute coronary syndrome (ACS)

Coronary heart disease (CHD) is a chronic degenerative condition, and patients who have recovered from an acute coronary syndrome (ACS) are at high risk of developing recurrent events (1). Secondary prevention has proved to be efficacious in patients with CHD and is strongly recommended by all international cardiovascular societies, but the Euroaspire I, II, III and IV surveys have revealed a gap between the guidelines and real-world clinical practice, and a lack of widespread preventive programmes (2).

It has been demonstrated that nurses can be successfully involved in cardiovascular disease (CVD) prevention programmes aimed at reducing risk factors, modifying lifestyles, and monitoring adherence

to pharmacological therapy, which are more likely to be effective in reducing CV risks over time (3-7).

Cardiovascular risk factors

Secondary prevention programmes can only have a limited effect on unmodifiable cardiovascular risk factors such as genetics, and so we concentrate on the classic, additive and psychococial factors that can be modified. There is considerable scientific evidence that *classic* risk factors such as diabetes (8-11), arterial hypertension (12-15), cigarette smoking (16-23), dyslipidemia (24, 28) and obesity (29-35) play a pathogenetic role in the development of CVDs, and that controlling or even reducing them has a beneficial effect on major clinical outcomes. *Additive* risk factors include physical activity (36-41), diet (42) and alcohol consumption (43, 44) for which there is a well-documented physiopathological rationale that may be involved in the reoccurrence of CVDs, but less concrete scientific evidence that they influence major clinical outcomes than

in the case of classic risks. Finally, there is increasing evidence (45) that *psychosocial* factors such as anxiety (46-50), depression (45, 51-59), anger and hostility (60-64), type A (65) and type D personality patterns (66, 67), self-efficacy (68-70), and isolation and a lack of social support (71-75) correlate with the onset and course of ischemic heart disease.

Adherence to pharmacological therapy and lifestyle changes

Therapeutic compliance requires the active collaboration of patients, who should be involved in the consensual planning and implementation of treatment (76). Various studies have highlighted the importance of not only modifying the risk factors described above, but also taking the prescribed drugs because it has been shown that this has a positive impact on the prognosis and reoccurrence of CVDs.

However, it is well known that there is a considerable lack of compliance to both (77). According to the WHO (78), this is due to a multiplicity of *socio-economic* (e.g. indigence, little health knowledge); *socio-demographic and clinical* (age, gender, stress), *psycho-social* (the perception of disease, beliefs concerning health and/or medicine), and *treatment-related* factors (the number and doses of drugs, and their side effects (79-81). Others (77) suggest that it can be attributed to *intentional* and *non-intentional* factors, the former, which often lead to treatment discontinuation, are characterised by a patient's conscious decision (a subjective conviction that the drugs are inefficacious or toxic; rational non-adherence), problems related to the presumed cost of treatment, insufficient exchange of information between physician/nurse and patient (defaulting), or an emotional response to the disease and is treatment; the latter by a patient simply "forgetting" to follow a prescription he or she explicitly wishes to respect.

1.2 Nurses' programmes for implementing therapeutic compliance

The involvement of nurses is a key element in the primary and secondary prevention of CVDs (82-84). Nurse-led health education programmes increase patients' awareness and understanding of a disease and its treatment, and improve their expectations concerning their health (85), thus favouring treatment compliance (5-7, 86, 87). Even relatively brief, individualised interventions (88, 89) based on multiple methods (e.g. direct contact, printed booklets and the use of audiovisual aids) can lead to self-care behaviours (90), and may improve outcomes (91,92) even in the long term (93).

One major challenge when trying to improve health results in ACS patients is to implement multi-dimensional, structured nursing care pathways oriented towards therapeutic continuity (94, 95) because the limitations of many programmes include the partial nature of their goals (e.g. concentrating on only one or just a few classic risk factors) and the lack of structured healthcare instruments that demonstrate their efficacy in terms of outcomes. For example, the Global Secondary Prevention Strategies to Limit Event Recurrence After Myocardial Infarction study (6) does not propose a nursing care model for managing patients during follow-up or describe the changes in nursing care activities generated by the training. The RESPONSE study (7) did not specify whether or not the healthcare professionals had participated in a special training programme, and therefore does not describe what the content of such a programme might have been or what method was used. Finally, the paper describing in the principal results of the EUROACTION study (5) does not mention the training of nurses, the nursing model and instruments used, or collaboration with or other professionals such as a psychologist or dietician.

2. The ALLiance for sEcondary PREvention after an episode of acute coronary syndrome (ALLEPRE) trial

1.1 Study design

The ALLEPRE trial is an Italian multicentre, randomised and controlled study designed to compare the benefit offered by a structured, intensive and fully nurse-led intensive secondary prevention intervention programme (ISPP) with that offered by standard care in a high-risk population of ACS patients admitted to cardiological centres in the Region of Emilia-Romagna. The patients are randomised 1:1 by means of a centralised interactive voice response system under the responsibility of the Study Coordinator and the Principal Investigator of each centre. The two primary

endpoints are the difference in the degree of adherence to goals concerning risk factors, lifestyle modifications and pharmacological therapy between the start of the study and month 24, and the occurrence of major adverse events (all-cause mortality, non-fatal re-infarction or non-fatal stroke) after five years of follow-up.

In order to create an ISPP that is consistent in all participating centres, the nurses underwent a preliminary centralised training programme provided by a multidisciplinary team of medical, nursing and psychological experts coordinated by the Training and Continuous Education Centre of Parma University Hospital with the support of *ad hoc* paper-based teaching material. The programme, which was repeated four times In order to allow the creation of small groups and promote better interactions, consisted of three 8-hour sessions held on consecutive days during which the professional nurses proposed by the participating centres (6-10 per centre, 50% from a hospital setting, 50% from a community setting) were trained in secondary CVD prevention, and how to take multi-dimensional and structured responsibility for it using appropriate communication strategies aimed at reducing risk factors, modifying lifestyles and improving adherence to prescribed pharmacological therapy.

1.2 Multi-dimensional nursing form (MNF)

During the training sessions, the nurses were trained how to use an innovative multi-dimensional nursing form MNF, an interactive guide to patient assessment and education aimed at promoting all three of the above objectives. Based on the latest scientific evidence and the Cardiovascular Secondary Prevention Guidelines (10), it was prepared by a multi-disciplinary team of nurses, cardiologists and psychologists from the University Teaching Hospital of Parma.

The MNF is the working instrument that will be used for all of the nine interviews planned for the patients in the study's experimental arm: a pre-discharge interview will be followed by others after one, three, six, 12, 18, 24, 36 and 48 months. It is based on a "cure" and "care" nursing paradigm that affectively integrates the bio-clinical and psycho-socio-relational dimensions of nursing also by means of the use of NANDA language (97) and a cardiovascular narrative approach (98). The model considers CVD in the three senses of

"illness", "disease" and "sickness", and uses quantitative and qualitative data collected by means of narrative-based interviews in order to make a multi-dimensional assessment of each patient with the aim of arriving at a more profound understanding of their and their caregivers' (the phase of nursing ascertainment). The model of care is based on a nurse/patient/caregiver co-construction of the therapeutic plan and personalised education in order to favour behaviours oriented towards reaching the ALLEPRE study endpoints.

In addition to a socio-demographic part that includes the patient's personal details and CV medical history (the number of CV events at the time of admission), the MNF is divided into five areas, each of which is covered during all of the nine interviews:

- A) the assessment of classic risk factors (diabetes, smoking, hypertension, dyslipidemia, and obesity);
- B) the assessment of additive risk factors (physical activity, diet, and alcohol consumption);
- C) the assessment of psycho-social risk factors (anxiety, depression, anger/hostility, type A and D personality patterns, self-efficacy, and social support);
- D) the assessment of adherence to CV drugs (aspirin, anti-aggregant, ACE inibitor/sartan, statin, beta-blocker) and other drugs (e.g. anti-depressant and anxiolytic), as well as the intentional (insufficient information, incredulity and irrationality) and non-intentional (forgetting) of therapeutic non-compliance;
- E) the nursing ascertainment by means of a narrative interview.

Areas A-D has fields for the ascertainment of CV risk factors, the definition of selected nursing diagnoses and related objectives, and the definition of the educational interventions required. Area E consists of a grid with the stimulus questions that guide the narrative interview, which is essential for completing the assessment of aspects relating to disease perception, strategies for coping with the critical event and the difficulties perceived by the patient in relation to the prescribed treatment (e.g. What are the difficulties you may encounter once you return home? What strategies will help you to confront the disease and its treatment?).

Figures 1-6 shows some sample extracts of the MNF.

NURSING MULTIDIMENSIONAL FORM (NMF)

PERSONAL DATA

Patient's ID: _____ (insert patient's serial number as Case Report Form)

Randomization date (day/month/year):_____

Name and Surname _____

Gender: Male [ ] Female [ ] Other [ ]

Date of birth : _____

Education: Primary School [ ] Secondary School [ ] High School [ ] University Degree [ ]

Marital Status: Married [ ] Separated/divorced [ ] Single [ ] Partner [ ] Widow/wer [ ]

Living status: living alone [ ] living with not self – sufficient persons [ ] living with self – sufficient persons [ ]

Cardiovascular health: first event [ ] not first event [ ] episode N [ ]

Figure 1. Socio-anagraphic area (example)

Nursing assessment		Nursing Diagnosis (NANDA, 2012-2014)	Threrapeutic Goal	Obtained	To be kept	Nursing interventions (to be performed)
OBESITY No [ ] Yes [ ]	Weight =_____Kg Height=_____mt BMI =_____Kg/m2 (see chart)	Insert NANDA code/s [ ]	BMI 18-24,9	[ ]	[ ]	Dietary Education and physical exercise Education to control other cardiovascular risk factors Caregivers' involvment during educational event **Use of patient's leaflet** during educational events

Figure 2. A Area: Typical risk factors (example)

Nursing Assessment		(NANDA, 2012-2014) Nursing Diagnosis	Threrapeutic Goal	Obtained	To be kept	Nursing interventions (to be performed)
To integrate with "narrative Nursing" assessment E AREA						
PHYSICAL EXERCISE No [ ] Yes [ ]	If NO: Physical impairment ? No [ ] Yes [ ] If YES, Which one? _____	Insert NANDA code/s [ ]	At least 30 min/day - 5 times/week	[ ]	[ ]	Education to patient's phisical exercise Active Involvment of caregivers **Use of patient's leaflet** during educational events

Figure 3. B Area: Additional risk factors (example)

Nursing Assessment		(NANDA, 2012-2014) Nursing Diagnosis	Threrapeutic Goal	Obtained	To be kept	Nursing interventions (to be performed)
To integrate with "narrative Nursing" assessment E AREA						
ANXIETY No [ ] YES [ ]	Score obtained _____	Insert NANDA code/s [ ]	Low/zero level 0-4	[ ]	[ ]	Active listening to patient To assist patients in expressing their thoughts and feelings without assuming a judging approach To have an empathic approach To help patients in spotting worrying situations To identify dysfunctional coping styles To assess the existence of psychological problems preceding heart disease, the presence of work or family social or relational problems To identify frequent family and work requests and the availability of personal resources Active involvment of caregivers

Figure 4. B Area: Pshyco-social risk factors (example)

To integrate with "narrative Nursing" assessment E AREA			(NANDA, 2012-2014) Nursing assessment	Threrapeutic Goal	Obtained	To be kept	Nursing interventions (to be performed)
Unintentional Factors Memory impairment Area No [ ] Yes [ ]	Specify: Old age [ ] Memory impairment [ ] Unfavourable social-economic context [ ] Other _____ _____ _____		Risk of non compliance of therapeutic regimen related to: [ ]	*Stressing the importance of remembering terapeutic regimen:* patient must report he has understood the role of taking medications and he remembers number, dosing, times of taking medicines, by using a proper instrument	[ ]	[ ]	To train to self-monitoring by using diaries, schedules, reminders, pils counter and so on. Trying to find out the best strategy to harmonize the foreseen changes with patient's life style. To employ "teach back" technique. To create a relationship of mutual trust and responsibility. Necessary involvment by caregivers

Figure 5. D Area: Pharmacological compliance (example)

SURVEYED AREA	INTERVIEW	KEY WORD	STRINGS (patient's narrative abstracts)
Compliance to therapeutic plan	Could you explain which will your behaviour be when you go back home?	Understanding the nature of prescribed behavioural changes (for instance quit smoking, to check diet and physical exercise) Understanding number, type and times of assumption of prescribed medications Understanding the importance of changes in life style and drug assumption Understanding risks connected to lack of compliance	_____ _____ _____ _____
	What are the main problems you are afraid of facing, as far as changes due to disease and therapeutic prescriptions are concerned?	(Intentional Factors) Mistaken belief that drugs are uneffective and/or harmful Mistaken belief about illness Feeling of being unable to manage changes (for instance quit smoking /diet /phisical exercise) Disproportionate work/family and domestic burden Emotional response to disease (for instance, refusal, skepticism) Emotional response to therapy (for instance, restricting, unncecessary) (Unintentional Factors) Cognitive impairment (obliviousness) Unfavourable social-economical context (i.e. need, low healthcare education)	_____ _____ _____ _____ _____ _____ _____

Figure 6. E Area: Assessment through Narrative Nursing (example)

3. Conclusions and clinical implications

The ALLEPRE trial is the first to test a structured, fully nurse-led, intensive secondary prevention programme based on a broad multidisciplinary network of primary care and hospital nurses in a large population of high-risk ACS patients in Emilia-Romagna (sufficiently representative of Italy as a whole) by evaluating its clinical efficacy on major endpoints and its feasibility and impact on the regional healthcare system.

The MNF is an innovative instrument aimed at maximising the great potential contribution that nurses can make to CV secondary prevention. Based on a multi-disciplinary, it allows a multi-dimensional assessment that takes into account both bio-clinical and psycho-socio-relational factors, thus responding to four major healthcare needs by:

1. orienting the assessment of risk factors and treatment compliance in ACS patients by means of standardised parameters based on scientific evidence;

2. using narrative interviews to identify disease-related problems and factors predicting non-compliance, thus allowing the personalisation of subsequent interventions;

3. maintaining continuity of care between hospital and home with the aim of improving health outcomes by increasing treatment compliance and reducing the incidence of re-infarctions and re-hospitalisations as a result of multiple follow-up visits;

4. overcoming the known limitations of concentrating exclusively on bio-clinical aspects and ignoring psycho-socio-relational factors, by evaluating the efficacy of the instrument itself in terms of its effects on nursing practice in various operational contexts.

Last but by no means least, the inclusion of the MNF in a 5-year clinical trial will make it possible to assess whether the patients treated using the form's underlying model of integrated care will lead to better health outcomes than those achieved using traditional standards of care.

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