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Nurse training in self-management of patients with cardiovascular diseases: a multicentre observational study

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Abstract. *Background and aim:* The therapeutic education and self-management carried out by nurses, are winning elements in cardiovascular secondary prevention, but because they are complex matters, they require special training by the professionals. The target of the study has been to assess the effects in clinical practice of a training program for nurses in the management of patients with cardiovascular diseases, leaning towards a self-oriented patient management and therapeutic patient education. *Method:* The research utilized a quali-quantitative study to compare the responses of 53 trained nurses (experimental group) and 101 untrained nurses (control group). The instrument used was a self-report structured in two sections: the first, a qualitative kind, was used to investigate the portrayal of nurses regarding self-management; the second, a quantitative kind, included a Likert scale based on 5 points (1=never, 5=always) that investigated the professional nurse's action in its bio-psycho-socio-relational and clinical activities (La Sala, 2012). *Results:* The trained nurses' approach is more oriented towards the psycho-socio-relational dimension, compared to the untrained nurses. A difference also emerged regarding activities of a bio clinical nature, which are performed much more by untrained nurses compared to trained professionals. *Conclusions:* The health education and self-management skills were used by trained nurses during their care of patients with cardiovascular diseases, stressing the importance for professional nurses to develop an integrated competence, using narrative talks as the main tool in a patient-centred approach.

Key words: self-management, self-care, healthcare paradigm, education, cardiovascular disease, nurse training, secondary prevention

Introduction

Cardiovascular diseases represent a high prevalence chronic illness due to the population aging (0.5-2%) and they are also related to the decrease in quality of life, the high mortality rate and the high health care costs (1-3). Patients suffering from chronic cardiovascular disease are prone not only to a continuous polytherapy intake but also to significant lifestyle changes. These transformations also affect the psychological sphere by influencing the psychosocial well-being. The challenges associated with these lifestyle changes are therefore very difficult, as patients may have the perception of having lost control of their lives. It is in this delicate phase of the illness that the nursing profession plays a central role, since it's the closest to the patient and more able to carry out educational activities to achieve the patient's therapeutic adherence (4-6).

Therapeutic adherence, understood as an active, voluntary and collaborative participation in a mutually acceptable path, of a conduct designed to achieve a therapeutic result (7). Numerous studies also show that therapeutic adherence positively influences long-term health results of the cardiovascular disease patient,

such as the quality of life (8, 9). Other studies and the European Society of Cardiology (ESC) through the RESPONSE program (10, 11), found the effectiveness of nursing education in primary and secondary prevention, demonstrating its concrete feasibility in a number of healthcare systems, with organizational results (for example, reduced frequency of unplanned hospital readmissions, reduced hospitalisation time and health system costs). Other studies have particularly highlighted how self-management and decision support are recognized as integral parts of many models for the prevention and management of chronic diseases by the patient (12-15). Adequate levels of self-management improve, in fact, the quality of life, reduce mortality and use of health services. Self-management skills particularly help patients make conscious choices leading towards a therapeutic adherence and a satisfying life (16-18). From the etymological point of view, the term self-management consists of the words "management" and "self". Management has to do with motivation, planning, goal setting, resource calculation, control, and a monitoring based on the assigned task. The self, on the other hand, has a double meaning: it refers to an autonomous self-contained subject, without any external intervention, and at the same time the subject is the object of action (19). Specifically, self-management is defined as the practice where the patient, in collaboration with nurses and other healthcare providers, assumes greater responsibility in health decisions; a set of tasks, supported by education, that the individual will have to acquire and use to manage effectively, reinforcing autonomy in its chronic condition. These activities include trusting self-management of behavioural risk factors (e.g. physical activity, diet, smoking and alcohol), role management, and emotional management of their conditions; all this through three fundamental tasks: monitoring and managing signs and symptoms of the disease; adopting a healthy lifestyle and behaviour and pharmacological adherence and maintaining a regular contact with healthcare professionals. It is a strategic approach that allows us to plan and regulate life activities efficiently and successfully (20). Therapeutic education and self-management are therefore winners in secondary prevention, but they are also complex subjects that require specific expertise from professionals, because of the simultaneous presence of many different aspects, not only the ones regarding biomedical sciences but also psychological, pedagogical and social sciences. For this reason, the planning of self-management educational interventions with patients suffering from cardiovascular diseases, necessarily requires multifactor approaches and specific methodologies, planned and accurately described in the prevention programs themselves (21, 22).

The European Guidelines (2016) on cardiovascular disease prevention in clinical practice suggest that the education stage, which is indispensable in nursing professional care, needs to be developed in a targeted manner. According to a recent study (23), the nurses' knowledge of educational methods in cardiovascular disease management should be implemented through an ad hoc training, to improve the knowledge of care and the principles that support the role of the patient in carrying out its own self-care. All this requires deep knowledge not only of the bio clinical dimension (e.g. vital parameters check, anthropometrics indexes) but also of the patient's psycho-socio-relational dimension (e.g. evaluation of the patient's mood alterations, its self-efficacy) with the purpose of educating them in early recognition of the signs and symptoms of the disease, and to self-manage the disease also psychologically (24, 25).

A randomised study based in the general medicine area (26) highlights how specific training aimed at developing skills in educational interventions, improves nursing skills to provide adequate self-management support to chronic patients, with a significant improvement in the way of dealing with the disease. Therefore, it's important for nurses to develop the skills to educate patients suffering from cardiovascular diseases.

On the contrary, some studies have shown that the health care staff concentrates mostly on the patient's bio-clinical dimension, underestimating its self-management education, as well as the psycho-educational-relational aspects (27). Even in Ritsema's (2014) study, only a percentage ranging from 13 to 42% of nurses said they provide self-management education to chronic patients (COPD, diabetes, asthma, hypertension, obesity and ischemic heart disease), while the remaining part focuses mainly on aspects of a bio-clinical nature (28). Another study, based on a group

of nurses, points out how in COPD patients the self-management of the illness is a very important factor in the healing process, but that various causes limit this aspect, including lack of time and lack of professional knowledge on self-management issues, yet to be developed (29).

It also emerges that nurses are not yet fully aware of the self-care concept, which should play a part in the management of patients with cardiovascular diseases, but that participating in training programs for skills development has led to an increase in knowledge of the principles of self-care (30). Other studies also confirm these results (31), authors have estimated that both nurses and doctors, at baseline level, have very little knowledge about self-management. However, following short training days they implemented their knowledge and improved their behavioural, cognitive, and communication skills, easing the self-management of the illness. Professionals therefore need ad hoc training projects to implement their background in basic knowledge and in the use of specific communicative and relational actions to enable self-management in the patient. Literature revision shows that increased sensitivity and awareness of the impact of self-management in patients (emotional self-management of the disease, signs and symptoms, applied healthy behaviours and pharmacological adherence), improves the effectiveness of educational programs for patients with cardiovascular disease. It also highlights the value of training courses for nurses to implement patient education for a self-care approach to their illness, although it is unclear how the knowledge gained during a training course declines in action and maintenance in time.

Aims and hypothesis

Given this evidence, an attempt was made to evaluate the effectiveness of a training program for nursing professionals dealing with patients with chronic cardiovascular diseases, trying to evaluate its role in assisting care. The study is based both on quality and on quantity. The hypotheses that led to the research were two:

H1: Trained professionals focus more on self-management aspects than those who have not been trained. H2: Attention to the psycho-educational-relational aspects of care, compared to bio-clinical ones, is greater in nurses than in those who have not been trained.

Description of the training program

A multidisciplinary team of nurses (N. 4), cardiologists (N. 2) and psychologists (N. 2) took part in the training program; the selection of the team was based on competence in managing patients with cardiovascular disease. The training program was oriented to standardize the risk factor assessment and adherence to treatment of patients affected by chronic cardiovascular diseases. Through standardized parameters, based on accurate scientific evidence, the aim was to evaluate disease related issues and the predictors of treatment non-adherence through narrative talks, allowing the development of a more personalized care. The nursing paradigm underpinning the self-management education program was of an "integrated" kind, which took into account both the importance of "care" and "taking care": the bio-clinical and psycho-social-relational dimensions of nursing care. In order to guarantee a comprehensive and personalized care project, this model characterizes the nursing care as a simultaneous process of curing and caring, which includes explanation, understanding, education and guidance efforts.

The Integrated Nursing Model seems very useful to set up the assessment, the assistance and the education (32-35). The integrated model, in addition to providing a multidimensional approach, is reinforced by the inter-professional dialogue between nurses, physicians, sociologists, psychologists, and other health professionals: the "narrative interview" is used for understanding the depth of the bio-clinical and psycho-social-relational needs of the patients and their caregivers. Specifically, nurses were trained to develop skills in nurse-patient-caregiver co-construction. By actively listening to the patient's story, nurses are able to identify its care needs. More specifically, the nurses training, which consisted of three eight-hour sessions held in consecutive days, aimed at developing skills in order to structure a patient-oriented self-management therapy program in relation to adhering to a healthy lifestyles and to pharmacological treatments (36-37).

In summary, the purpose of the nursing education program was to increase therapeutic adherence by overcoming the limits already known in literature that mainly focused on bio-clinical aspects by neglecting psycho-educational-relational ones, in order to improve self-management in patients.

Method

Both healthcare facilities and their nurses (participants) were selected through a convenience sampling.

Participants

The sample, consisting of 53 trained nurses (experimental group) and 101 untrained nurses (control group) operating in territorial health facilities (N. 4) and hospitals (N. 1) in the centre of Italy, was selected on a voluntary basis. Table 1 describes the socio-nominal characteristics of trained nurses and non-trained nurses, as well as the membership units.

Tools

A self-report questionnaire structured in two sections was used. The former investigated the representation of nursing professionals over self-management, referring to the evocative component of the meaning of self-management; specifically, the nurses were asked, in regards of their professional work, to indicate the first five words that come to mind when thinking of "self-management". A second section included a structured scale investigating the nursing profession in first-time patients or those already in their charge, considering the patient's acceptance and assistance as two very intense phases of nursing care (32, 38). Specifically, through a 5-point Likert scale where 1=never, 5=always, it was investigated to what extent nursing practices related to bio-clinical and relational psycho-educational aspects would be applied. In the nursing profession, the bio-clinical dimension includes attention to purely clinical activities associated with cardiovascular diseases, specifically the monitoring of signs and symptoms (e.g. angina), vital parameters (e.g. arterial pressure, heart rate and oxygen saturation), instrumental examinations (e.g. a.b.g. and electrocardiogram) and pharmacological treatment. The psycho-educational-relational dimension, on the other hand, concentrates on the dedicated attention of the nurses to the psycho-educational-relational aspects of patients with cardiovascular disease (e.g. active listening, coping strategies, self-esteem, and sickness experience). Trained and untrained nurses filled in the self-

Table 1 Trained and untrained nurses' demographic variables (absolute values and percentages)

Variables	Untrained nurses (101)		Trained nurses (53)	
	N.	%	N.	%
Gender				
Male	79	78.22%	10	18.87%
Female	22	21.78%	43	81.13%
Work experience				
Less than 10 years	31	30.69%	14	26.42%
More than 10 years	70	69.31%	39	73.58%
Membership task force				
Cardiology clinic	18	17.82%	3	5.66%
Primary care clinic	6	5.94%	3	5.66%
Inpatient Cardiology	27	26.73%	19	35.85%
CICU	39	38.61%	25	48.17%
Cardiac rehabilitation	4	3.96%	1	2.00%
Emodynamics room	7	6.94%	2	2.00%
Work experience in Cardiology				
Less than 10 anni	46	45.54%	31	58.49%
More than 10 anni	52	51.49%	22	41.51%

report, administered online in January-February 2016, at the end of their shift (morning or afternoon)[1], following the relevant institutional authorizations.

Data analysis

In order to verify that the importance of self-management was mostly perceived by professionals rather than the untrained ones, we analysed the responses referring to a more emotional side, that better represent the core of self-management.

In addition, only the terms used with a frequency greater than or equal to 10 were subjected to a qualitative vocabulary analysis (lemmatisation and normalization). A further level of analysis has allowed us to assess whether there was any difference between the group of trained professionals and the non-trained group regarding the meaning of self-management. The data analysis only considered the words with a significant difference between the two groups, so the words of the general corpus, ordered for the value of P with an occurrence <0.05, were evaluated. Qualitative data was analysed through software R (39). We performed a factorial analysis (main component method, rotated matrix) of the constructs considered (bio-clinical dimension and psycho-educational-relational dimension). Through a descriptive and inferential statistic (mean, standard deviation, F test), the second hypothesis, that assumed a statistically significant difference between the two groups, was verified. Quantitative data were analysed through the SPSS statistical program (40).

Results

Considering the importance of self-management perceived by all nursing professionals (both trained and not), the results clearly show that the most represented words are education (N. 63), self-management (N. 52) and self-care (N. 41) of the patient. Table 2 describes the whole semantic universe of the collective imagination and the representation of all the participants involved in the study, from which a total vocabulary is composed of 28 different lemmas.

Table 2. The most commonly used words by all the professional nurses

Lemmas	Frequency
Education	63
Self-management	52
Self-care	41
Patient	41
Management	37
Autonomy	35
Competence	31
Collaboration	30
Disease	27
Knowledge	22
Chronicity	22
Organize	21
Cure	20
Prevention	19
Empowerment	18
Therapeutic	18
Know	17
Awareness	16
Participation	15
Information	14
Coordination	13
Responsability	13
Help	12
Targets	11
Life	11
Work	10
Planning	10
Style	10

The word *education* specifically refers to the purely therapeutic aspect of the patient's care path (0.27), to improved self-ability (0.26) and listening ability (0.25). *Self-management* on the other hand, was mostly associated with the terms of adopting proper lifestyle behaviours (0.27), the importance of professional support (0.25) in order to achieve a self-management capacity of patent's disease. Even *self-care* was found to be more associated with the education terms (0.26) and style (0.17), frequently associated with life (0.95), which was then understood by professionals as a lifestyle. Regarding the meaning of self-management, the results highlighted interesting differences between the trained group and the non-trained group. The group of non-educated professionals has a self-management view that leans towards context (t=2.90, p=0.002), co-

[1] The night shift was not taken in consideration because of the reduction in need of assistant care.

ordination of activities (t=1.90, p=0.03) and collective work (t=1.80, p=0.03). Within this vision, although mentioning the psychological dimension (t=1.90, p=0.01), the focus is still based on the organizational aspects of nursing work. On the other hand, the group of trained professionals' vision focuses on the patient (t=3.60, p=0.001) and on secondary prevention (t=3.80, p=0.001), which defines a priority target that puts the patient at the centre (t=2.0, p=0.02), recognizing its chronic state (t=2.20, p=0.01) where the improvement of the patient's knowledge (t=2.30, p=0.01) is also decisive through the activation of a motivational interview (t=2.50, p=0.005).

Regarding activities of patients with early acceptance, we realised that the concerning items saturate the two dimensions of the scale (bio-clinical dimension and psycho-educational-relational dimension); so we decided to delete the item: "*Reception and orientation of the assisted person and his / her family members / caregivers within the Operational Unit during the first*". This because the application had equivalent saturation on the two factors, indicating how little it is distinguishing (Table 3).

Regarding the activities for already admitted patients, the two dimensions, the bio-clinical and the psycho-educational-relational one are also confirmed. Again, in this case, three items were excluded: "*formulation of an individualized assistance plan on the basis of the formulated welfare objectives*"; "*sharing the patient care plan with the patient*"; and "*sharing the care plan with the caregiver*", as resulting not distinguished enough (Table 4).

Table 3. Activities with patients in first acceptance and their adherence to both the bio-clinical and psycho-educational-relational dimensions

Matrix of rotated factors		
Activities	Factor	
	Psycho-educational-relational	Bio-clinical
Survey on the patient's current and / or current clinical condition	0.35	0.87
Detection of modifiable and non-modifiable risk factors	0.41	0.64
Detection of vital parameters		0.52
Survey on the patient's current and / or current relational status	0.92	
Survey on the patient's current and / or current psychological condition	0.70	0.41

Table 4. Activities with patients that were already hospitalized and their adherence to both the bio-clinical and psycho-educational-relational dimensions

Matrix of rotated factors		
Activities	Factor	
	Psycho-educational-relational	Bio-clinical
Active listening of the patient about the strategies put in place	0.894	
Active listening of the family / caregiver about perceptions and experiences of the illness	0.866	
Detection of any socio-relational problems related to the disease	0.849	
Active listening of family members / caregivers about the strategies implemented to address the events related to the illness of your family member / assisted	0.847	
Active listening of the patient about current and / or past experience of illness	0.810	
Detection of any psychological problems related to the disease	0.739	
Monitoring and monitoring of urinary elimination		0.909
Monitoring the hydro-electrolytic equilibrium		0.748
Administration of prescribed therapy		0.708
Performing blood tests, peripheral venous catheter management		0.647

Confirmation of the second hypothesis clearly emerges as the nurses, trained through the training program, declare greater attention to the psycho-educational-relational aspects than the uneducated nurses, both in patients with early acceptance and in patients already admitted (Table 5).

There is a statistically significant difference between a group of educated nurses and non-educated nurses: nurses who have undergone cardiac education lean their behaviour towards the psycho-educational-relational dimension more than those who did not do the training (F (1.196)=23.641, p<0.001); there are no differences regarding bio-clinical behaviours (Figure 1).

The results also reveal there are more relational activities among trained nurses with less work experience than with those that are more experienced. This in the case of first-time patients (M=3.99-DS .83 - trained nurses; M=2.95-DS 1.16 untrained nurses), and in pre-hospitalised patients (M=3.75-DS .88 trained nurses; M=2.75 DS 1.08 - untrained nurses).

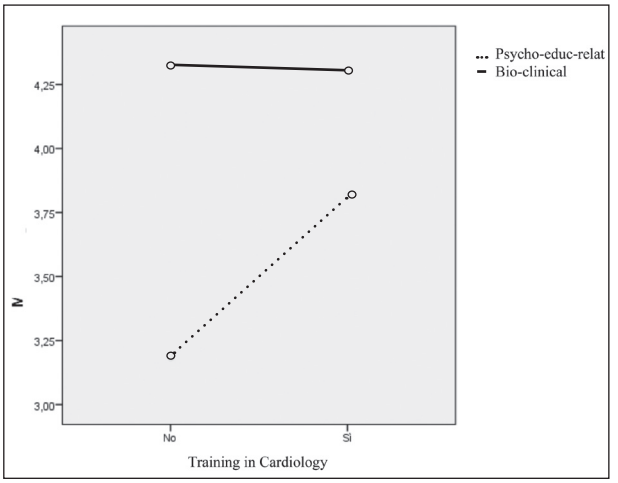

Figure 1. Interaction between behavioural kind, (bio-clinical or psycho-educational-relational) and whether or not they took part in the training

Conclusions and discussion

Increasing the incidence of chronic diseases, including cardiovascular diseases, is one of the main issues for rebalancing health systems where post-base training is one of the main strengths to ensure the development of skills and , therefore, the importance of nursing in the specific management of these patients (23). In this scenario, and as evidenced in literature, the study confirms the importance of training in patient management with cardiovascular diseases with a treatment adherence sense (11). The research has made it possible to evaluate how the skills acquired by the nurses in terms of health education and self-management, during the training, can be maintained for some time after the training itself. This is also due to a greater awareness of professionals skills not only as owned but also as capitalized in the patient's with cardiovascular diseases care path. Analysis of the results clearly shows how trained professionals better perceive the self-management dimension than those who are untrained. Specifically, the trained nurses most captured aspects lean towards assistance, which integrates clinical purposes with those of a relational

Table 5. Attention dedicated to the trained and untrained nurses' bio-clinical and psycho-educational-relational dimensions

Dimension	Nurse Group Untrained (N=101) and Trained (N=53)	M	DS
Psycho-educational-relational dimension, first acceptance patient	Untrained	3.3168	1.11068
	Trained	3.9124	.95746
Bio-clinical dimension, first acceptance patient	Untrained	4.3168	.77370
	Trained	4.5052	.82652
Psycho-educational-relational dimension, already hospitalised patients/all the patients in their charge	Untrained	3.0528	1.03573
	Trained	3.7182	.77704
Bio-clinical dimension, already hospitalised patients/all the patients in their charge	Untrained	4.3317	.91317
	Trained	4.1057	.95663

and educational nature. In this sense, in addition to monitoring of the signs and symptoms of the disease, patient education is also pushing to adopt healthy lifestyles and positive behaviour aimed at therapeutic adherence and a regular contact maintenance with health workers. The patient is encouraged to create a therapeutic alliance with the nurses and is motivated to achieve greater autonomy in the management of its disease. It is interesting to note how those behaviours declared by trained nurses are particularly adherent to the meanings discussed during the training and how they were developed in their nursing practice. This ultimately led to confirm how the emphasis on psycho-educational-relational aspects of care, (e.g. active listening, the patient's relationship with the disease) than on those of bio-clinical nature (e.g. control and monitoring urinary elimination, vital signs), is mostly highlighted in trained nurses than in non-trained nurses. In addition, trained nurses with a younger age, despite having a length of service of less than 10 years, show a greater inclination to act the psycho-educational competences acquired during the relational path formation. The results obtained from this study will enhance those in literature; for this reason, today more than ever, healthcare organizations and nursing professionals are called upon to invest in the development of core competencies for improving education in the health of chronically ill patients (38, 41-44). With this is mind, specific training in the field of Cardiology is an advantage on different levels: for the patient, in terms of health, for professionals, as they develop advanced skills, making more timely and effective answers and finally for organizations that can draw new organizational structures, capable of responding to the growing health needs.

In conclusion, the patient centred care and nursing education models should be used to develop the immense potential of the profession, with the objective of a continued growth in competence, responsibility and autonomy and to make professionals aware of the important role they play in terms of quality of care and health in chronic conditions. The study ultimately stimulates further research ideas such as the assessment of the health outcome of cardiac patients that follow a self-management education program run by nurses.

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