Acta Biomed for Health Professions 2014; Vol. 85, S. 3: 14-27

Therapeutic adherence and health outcomes in acute coronary syndromes (SCA) patient: the role of nursing

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Abstract. *Background and aim:* The literature on cardiovascular disease has highlighted that therapeutic adherence is often inadequate. What are the reasons for this poor adherence to medication? The goal has been to measure the different factors related to therapeutic adherence, differentiating the SCA patients on three levels of self-referred therapeutic adherence and delving the relations between self-reported therapeutic adherence and socio-demographic, clinical, emotive, cognitive and socio-relational variables. *Method:* A total of 84 Italian patients (66.7% males) with (SCA) took part in the study and completed a semi-structured questionnaire investigating the variables described above. *Results:* Results indicate the influence of clinical variables, showing that patients suffer more of dyspnea and angina symptoms than those that state to follow prescriptions. But the emotive aspects seem able to interfere more with the adherence: the subjects scarcely adherent have felt more threatened by their illness, and experimented more symptoms of anxiety and sadness than highly adherent patients. At a cognitive level the adherent patients have chosen coping strategies not centred on emotions, but headed to the solution of the problem. At socio-relational level is confirmed the importance of the social support in favouring the adherence. *Conclusions:* Among the different factors here considered, are those psychological and relational that tend to be associated to level of adherence for prescriptions. The outcomes have shown that the demo-graphical and clinical variables result are not tightly associated to the adherence, confirning instead the importance of psycho-social factors, as already notable in the literature in heart studies. The implications have been discussed.
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Key words: therapeutic adherence, health outcomes, patients, acute coronary syndrom, myocardial infarction

Introduction

Cardiovascular diseases are chronic degenerative with a high incidence of events and represent the main cause of death and illness in Europe, with 4.3 million deaths per year. Specifically, about Acute Coronary Syndromes (SCA), the incidence of returns might reach 20% per year (1). Three factors are considered able to reduce the recurring: the myocardial vascolarization, the best medical therapy and the change of life style with prescription therapy (2, 3). Nowadays only the revascolarization has been sufficiently adopted, while is yet under average the degree of adherence to prescription therapy and changes in life styles. The risk of recurrent of heart events, is strictly correlated to adherence to prescription therapy (1). The adherence, i.e. the active participation, voluntary and collaborative of the patient, in a mutually acceptable path, of a finalized behaviour to the therapeutic outcome (4), measures therefore how much patients assume drugs, as prescribed by their "health care providers" and as agreed on a plan of treatment (5).

The insufficient adherence to the treatment is credited among the main causes for all the diseases of under average outcomes (6, 7). In fact it is connected to a worsening of the health conditions, of the quality of life, of the increase of death rate, of the admissions and re-hospitalizations, with negative prognostic consequences and an increase of the healthcare budget (8-10).

Negative effects from absent adherence to therapy are either economical, and clinical in terms of worsening of health conditions and increase of death specific for heart attack patients (11-13). For instance, after a keen event, the regular intake of heart drugs "lifesavers" (anti-aggregating, beta-blockers, ACE-inhibitors and statins) upgrades the prognosis and reduces by 75% the probability of recurrent (14), while interrupting or suspending even one out of 4 heart protective drugs augments the risk of mortality in the range from 25% to 48% (15).

Given this facts, the International Guidelines, advocate for the regular use of such drugs, even though the literature peculiar for this filed highlights the several reasons why patients don't follow or give up (4). Some statistics show, in fact, that only 50 to 60% out of patients are adherent to prescription/s during a year (79), 1 patient out of 4 don't follow prescriptions after hospital demissions and that the adherence to therapy and changes in lifestyles, keeps on reducing step by step, time by time (16, 17). The scarce adherence is therefore a widespread problem resistant to "generic" approaches (19, 20, 22, 25): in fact, as it has heterogeneous causes, is difficult to measure and requires complex hands on to improve the quality of cures (18). The research in heart diseases about supporting/obstacles factors to the therapeutic adherence entails therefore a needed importance in side prevention projects. Some studies about main factors for scarce adherence, give evidence to many variables that, following the scheme from WHO (19), take mainly to: socio-economical factors (e.g.: low health culture, income too low for prescription purchasing, unemployment, destitution); factors linked to socio-personal and clinical characteristics of the patients (age, gender, cognitive and sensorial deficit, stress, low functional literacy, co-morbidity, depression or other psychiatrical disease); factors related to therapy and treatment (number, dosage and prescription collateral effects) and psycho-social factors, such as perceptions about illness, the "believes" about prescriptions, on medicine and on behaviour about health (18, 20, 21). In the literature have been explored the psychological variables, of cognitive and emotional type, that take patients to begin or interrupt the cure (18). On the opinion of Leventhal, Meyer e Nerenz (23), what emotional representations people develop about the illness may generate feelings of refuse/neglection and therefore act on evaluation processes and regulation of the needed cures. As argued by the theory of identity processes (24), we may consider SCA a menace to the sense of continuity, distinctivity, self esteem and self efficacy of the person, that may contribute to reduce the probability of adherent behaviour. The psychological reactions to the illness may then influence even the identity balance of the patient. The feeling of hopelessness, of pessimism towards the future and on own selves and the personal limitations on self efficacy, out coming from depression, can infect interfere with the fundamental commitment for the adoption and maintenance of health practices and behaviour to adherence (25-28). Even (under threshold behaviours of depression) seem to influence negatively on the path and prognosis of heart illness (29), mostly as consequence of a least adhesion to what must change in life styles (30, 31). Some authors state, a predictive effect also for the anxiety and death rate of patients (32). The worries towards own health conditions feed states of anxiety that consequently influence negatively on the heart end-point (33). Other researches highlighted the association between a pessimistic style and negative heart events (34). In such process other aspects of cognitive nature intervene, such as the personal convictions about the possibility to acquire control on the therapy. Furthermore many studies demonstrated the role of coping strategies in the psychological and physical health for a reading list check (35). For example, active coping strategies have shown a direct link to the stress perceived and the illnesses, because high levels of "hardiness" are associated to low levels of perceived stress and a reduction of symptoms bound to the pathology (36), on the contrary from what happens for coping strategies bound to emotional outburst, al cynicism and avoidance for a review check (6).

Furthermore the literature investigates social and relational factors, and in particular the perceived social support. It is defined as an interpersonal transition that may involve: involvement of emotive nature, strumental help, availability of information on the environment, evaluations on information about own selves (25). The proximity of familiar, friendly and social bounds are peculiarly functional to the physiopsychological recovery of ill people (38), even though not always results efficacious in satisfying the need of information (39). The process of acquisitions of information, infect, can have relevant implications for the outcome of adaptation (40).

The social isolation and low levels of social support perceived, on the contrary, encourage susceptibility and death rate for subjects with a heart illness (41) and increase the risks (42). Such conditions are recurrent in heart patients and constitute a risk factor, both because obstacle a good outcome of path and prognosis and because increase the risk of new events. Patients with a heart disease diagnosis, with low levels of social support of a strumental/functional kind (43), or emotive (44), that lead a lonely lifestyle (45, 46), in fact increase the risk of recurrent (42, 45, 47) and the risk of death (48). The impact of the social support is even mediated by other variables that cast justified pathofisiological associations to the heart illness, such as anxiety and depression. Other studies (65, 49), seem to demonstrate that in absence of a support may increase the calcification of artery in asymptomatic subjects, independently to the age and subjects and the presence of coronary risk factors. The social support affect also on the progression of coronary illness towards the arteriosclerosis (50).

Beyond all this, it should not be forgotten that even relational factors are useful to explain the adherence, connected as interpersonal relations and communications between professionals and patients, such as clearness and adequacy of information about pathology, as well as on prescriptions and the time span of the treatment, the authority of the caregiver, the time dedicated to patient and the frequency of follow-ups (20, 22); those are aspects that are not ever rightly (adequately) managed by care givers (51). Moreover and often patients don't perceive or perceive in an altered way information supplied; therefore it is suggested to give much attention to cognitive factors, emotional-motivational and relational, associated to understanding patients, illness and treatment, including the expected outcomes. Those are elements needed for explaining the adherent behaviour and therefore the success of the rehabilitative workflow (53).

Considering all above, the goal of this research has been to measure the therapeutic adherence and the different factors related to it, in a group of patients affected by Acute Coronary Syndrome, in order to increase knowledge about the phenomenon and supply suggestions to set some structured cure paths, headed to enforce therapeutic adherence about heart studies.

By a descriptive study, the research aimed to:

1) measure;

adherence to prescription differentiating the SCA patients on three levels of self-referred *therapeutic adherence* (high, middle, low);

2) delving the relations between self-referred *therapeutic adherence* and factors found in literature, specifically the following variables:

- *socio-personal* (gender and age),
- *clinical* (angina, dyspnea, self reported states bound to heart symptoms, comorbility and presence/absence of IMA),
- *emotive* (mood changes, states of anxiety, negative emotive representations bound to illness and perception of illness as a menace to identity),
- *cognitive* (coping based on problem/situation; coping based on emotions, coping based on avoidance of problem, sense of control on the treatment)
- *socio-relational (social support perceived by relatives, friends, partners and health professionals, satisfaction for the received cures by nurses).*

Method

The context of the research

The research has been conducted at the Azienda Ospedaliero-Universitaria di Parma, one of the 4 hubs of Regione Emilia Romagna. Out of a basis of a total number of access to the Intensive coronary therapy

Units between march and September in the year before the research (2011: N = 382), it has been expected the participation of about one third of the patients hospitalized between march and September 2012 (N =127) randomly chosen during the first interview of control after one month from demission.

Participants

The research, that took place between march and September 2012, had a correspondence of about 66% out of the chosen patients by a random sample. In fact, 84 patients with (SCA) participated, out of which 56 are male (66.7%) and 28 female (33.3%), dismissed after 30 days from the Unit.

In table 1 the socio-personal characteristics of the participants are listed.

The average *age* is 64.81 (*DS* ± 13,75). The range goes from 32 to 94 years. About the *marital status* 54 participants (64.3%) resulted married or in cohabitation. About *education* 36.9% (31) got a high school diploma. About the *employment* 28 participants have a job, out of whom 18 (21.4%) employed and 10 as free lance (11.9%). Among the subjects who don't get a salary, 45 (53.6%) are retired. On a total of 84 participants, 51 (60.7%) reported to have had a acute myocardial heart attack, while 33 (39.3%) reported to have had other cardiac problems than cardiac arrest (e.g.: unstable angina, heart deficit).

Table 1. Socio-demographic characteristics of participants (N = 85): frequency and percentages

Sex	Males	56 (66.7%)
	Females	28 (33.3 %)
Education	Elementary school diploma	27 (32,1%)
	Primary High school diploma	18 (21.4%)
	Secondary High school diploma	31 (36.9%)
	University Diploma	3 (3.6%)
	Graduate or Postgraduate	5 (6%)
Civil Status	Single	8 (9.5%)
	Married or cohabiting	54 (64.3%)
	Separated or divorced	4 (4.8%)
	Widowed	18 (21.4%)
Cohabitees	Alone	20 (23.5%)
	With wife/husband/partner	56 (65.9%)
	With children	6 (7.1%)
	With parents	2 (2.4%)
	With caregivers	1 (1.2%)
Employment	Worker employee	18 (21.4%)
	Self-employed	10 (11.9%)
	Retired	45 (53.6%)
	Housewife	7 (8,3%)
	Student	1 (1.2%)
	Unemployed	2 (2.4%)
	In mobility	1 (1.2%)

Tools

To measure the adherence to prescriptions was used the Morisky Medication Adherence Scale (54), that consider the *adherence* on a dichotomous scale with 8 items, one of those items has been erased "yesterday took medication for his heart problem?"given the fact that didn't correlate with the other items of the scale, probably due to statistical link of item (yesterday) than the other items (last for weeks).

About the other construct, the questionnaire included several research areas as follows.

The first area concerned the socio-personal (gender, age, education, employment, marital state and cohabitance) variables.

The second area researched the clinical aspects and, specially, the *presence or absence of the (*myocardial *heart attack*, the *comorbility*, the presence of specific symptoms of SCAs, i.e. *dyspnea* (4 item) and *angina* 4 item (55). A further scale (4 item) with 6 points (1 = 4 or more times per day; 6 = never in the past four weeks), measured the perception of *the limitations of activities correlated to the symptoms.*

The third area researched psychological aspects of emotive kind such as: *the emotive representation of the illness* (9 item), by a scale with 10 points (0 = minimum grade; 10 = maximum grade), already considered in former studies (56); the *menace to identity* given to the illness (10 item) by a scale with 6 points (1 = absolutely false; 6 = absolutely true); the state of *anxiety* and sadness (22 item) by a dichotomy scale (yes/no) built ad hoc.

The fourth area researched the psychological aspects of cognitive nature such as: the sense *of control of the therapy* 5 item (57); by a scale with 6 points (1 = never; 6 = always); the *strategy of coping* (21 item)

by the Italian version of CISS (58), in this research, with 6 points (1 = never; 6 = always). The related construct to the scale were 3: coping to situation; coping headed to emotion and coping headed to avoidance.

The fifth area researched the socio-relational aspects, in primes the social support perceived by the patient (16 item) by a scale of 6 points 1 = definitely not true; 6 = completely true (59). The scale referred to 3 constructed: social support by friends; social support by family and social support by a proxy. To this research 4 items were added about social support by health professionals. At last, it has been researched on satisfaction/dissatisfaction of the received cares at the hospital (19 item) by a scale with 6 points (1 = completely unsatisfied; 6 = completely satisfied) measuring competence, professional and affordability of care givers (86).

Data Analysis

The scales corresponding to the different constructs have been designed with the weighted average, or the sum of items included. The whole of the scales have had the inner coherence checked by the alpha of Cronbach.

To verify if the considered variables were part of the same macro-construct it was used the non parametric test Rho of Spearman. The correlations have been therefore calculated among the construct hypnotized as representative of the different macro-dimensions or researched factors (clinical, emotive, cognitive, socio-relational).

To verify if the level of adherence to the therapy varied in function to the hypnotized construct, in the begin the participants have been divided in three groups on the basis of a cut-off expected by the scale MMAS: (adherent, half-way adherent and non-adherent). In a second time, by the non parametric test of Kruskal-Wallis and the exact significance of Monte Carlo, it has been verified the difference in the values of the different researched construct in each areas (clinical, emotive, cognitive, socio-relational), as function of the level of adherence of the subjects.

Outcomes

Descriptive statistics

The inner coherence of the scales and the descriptive statistics of the examined construct by the tools are shown in table 2. All indexes include an adequate inner coherence.

Table 2. Descriptive statistics (N = 84; Cronbach's Alpha, means and standard deviations)

Factors	Indexes	Crombach's alpha	Min	MaX	M	SD
Clinical	Comorbility	.75	0.00	3.33	1.45	.60
	Dyspnea	.95	1.00	6.00	2.045	1.55
	Angina	.92	1.25	4.75	2.67	.71
	Limitation due to heart symptoms	.97	1.00	6.00	2.51	1.63
Emotive	Negative emotional representations of illness	.81	.33	9.11	5.111	1.88
	Perception of illness as an identity threat	.75	1.00	5.80	3.25	.92
	Anxiety	.91	0.00	11.00	4.24	3.53
	Sadness	.90	0.00	11.00	2.41	2.72
Cognitive	Control on the treatment	.76	1.20	6.00	4.36	1.23
	Coping based on problem/situation	.89	1.00	6.00	3.21	1.37
	Coping based on emotions	.83	1.00	5.71	2.50	1.14
	Coping based on avoidance	.82	1.00	6.00	2.71	1.19
Social-relational	Relatives, friends and partners social support supplied	.95	1.00	6.00	4.99	1.23
	Health professionals (nurses) social support supplied	.94	1.00	6.00	4.82	1.13
	Satisfaction for cures by nurses	.98	1.95	6.00	4.96	.99
Therapeutic adherence		.75	1.00	7.00	6.17	1.45

The participants present averagely factors of comorbility (e.g.: hypercholesterolemia, hypertension). In terms of associated clinical symptomatology to heart illness, present a scarce presence of dyspnea and, much more reduced, is the presence of angina; even the limitations self reported conseguent to it are in an average way valued by the participants lightly affected by the illness.

Taking seriously the emotive dimension of the participants, the results show that in an average way they feel menaced by cardiovascular illness, while the negative emotions associated to the illness, anxiety and sadness, are anyway relatively contained, notwithstanding the wide variability of data.

By the cognitive sphere of the participants, in line with the three strategies of coping used, comes out that situation based coping is the prevalent strategy, followed by the strategy of avoiding the problem and as last by the coping centred on emotions.

The results of the table related to social support, moreover, show that for social support from families and friends are crucial for the participants. Stating that for participants result central the social support of relatives and friends. Even health professionals give a strong support.

Coming to the satisfaction for the cares received at the hospital, at last, the participants argue that are very satisfied for the competence the staff, the professionalism and their receptiveness of professionals.

Adherence to prescriptions

The remarks of table 2 makes notable that the participants, mostly declare to assume by a high adherence prescriptions, even if by discrete variability, and case to case. On the basis of the scores obtained by MMAS, the indicators of adherence to prescriptions have been reconstructed. Given that the scale forecasts to set for every affirmative answer (measuring the absence of adherence) 0 score and for every negative answer (measuring the presence of adherence) 1 score, what results is that scores are constructed as follows: a score of 7 means a high adherence; a score between 5 and 6 means a middle adherence and a score under 5 means low adherence. On the basis of such ranges 3 groups of subjects are detected (Table 3).

Table 3. Cluster based on levels of therapeutic adherence (N = 84)

Levels of therapeutic adherence	Frequency and valid percentage
Low	10 (11,9%)
Middle	21 (25%)
High	53 (63,1%)
Total	84 (100%)

As shown in table 3, about 63% of the subjects affirm to have been completely adherent to prescriptions during the 4 weeks before the survey.

One fourth of the sample affirms to have been adherent, even if not completely, while more than 10% of the subjects have not been adherent to prescriptions.

The distribution of the participants in the three levels of adherence does not vary significantly as function of none of the considered socio-demographic variables (gender, age, education, marital status, cohabitance and employment) as results of the survey of the Chi Squared statistics and the non parametric test of Kruskal-Wallis (for the age) considering the exact significativity of Monte Carlo based on 1000 tables of samples.

Descriptive analysis and correlation of factors affecting adherence to prescriptions

The table 4 shows the descriptive statistics and the non parametric correlations among constructs related do clinical, emotive, cognitive and socio-relational factors. The diagonal line represents the indexes of inner coherence (alpha of Cronbach).

Clinical factors

We can observe what follows by the non parametrical correlations among the measures related to clinical factors, such as heart attack, comorbility, dyspnea, angina and limitationed bound to perceived symptoms. The presence or absence of a myocardial heart attack acute does not seem to be correlated to the presence of symptoms, that result therefore independent respect to various displays of acute coronary syndrome (e.g.: unstable angina). The clinical symptom of dyspnea is peculiarly important, given its high correlations both

Table 4. Descriptive statistics and non parametric correlations between constructs that assess clinical emotive, cognitive and social-relational factors (Spearman's Rho)

Factors		Min	Max	M	SD	1	2	3	4	5
Clinical	1 Myocardial infarction (1 = yes)					1	.13	.19	.21	.26
	2 Comorbility	0.00	3.33	1.46	01.00		.75	.28**	.08	.19
	3 Dyspnea	1.00	6.00	2.04	1.55			.95	.49**	.46**
	4 Angina	1.25	4.75	2.67	0.71				.92	.42**
	5. Limitation due to heart symptoms	1.00	6.00	2.51	1.63					.97
Emotive										
	1 Negative emotional representations of illness	0.33	9.11	5.11	1.88	.81	.57**	.54**	.48**	
	2 Perception of illness as an identity threat	1.00	5.80	3.25	0.92		.75	.52**	.56**	
	3 Anxiety	0.00	11.00	4.24	3.52			.91	.60**	
	4 Sadness	0.00	11.00	2.40	2.72				.90	
Cognitive	1 Control on the treatment	1.20	6.00	4.36	1.24	.76	.41**	-.35**	.20	
	2 Coping based on problem/situation	1.00	6.00	3.21	1.37		.89	.14	.62**	
	3 Coping based on emotions	1.00	5.71	2.51	1.14			.83	.27*	
	4 Coping based on avoidance	1.00	6.00	2.71	1.19				.82	
Social-relational	1 Relatives, friends and partners social support supplied	01.00.00	6.00	4.99	1.24	.95	.65**	.57**		
	2 Health professionals (nurses) social support supplied	1.00	6.00	4.82	1.13		.94	.77**		
	3 Satisfaction for cures by nurses	1.95	6.00	4.96	1.00			.98		

* $p < .05$, ** $p < .01$, Cronbach's Alpha is in diagonal line

to angina symptoms, and the perception of limitations (for instance social, work and family relations) given to declared symptoms. Even the presence of chest pain (angina) seems to limit the daily activities of the participants.

By the increase of breathing difficulties when associated to other health problems (diabetes, obesity, high pressure, hypercholesterolemia), anyway, the presence of such comorbidity does not seem to be correlated to any other variable included in this domain.

Emotive factors

For the correlations related to emotive aspects, such as emotive representation of illness, identity menace due to the illness and negative emotive states of anxiety and sadness, is noticed what follows (table 4). By reading the matrix is inferred how all considered variables are highly correlated the ones to the others, to state the lack of trust and worries bound to illness, even such as illness perception as a menace of the integrity of the person, are able to influence the emotive state of the participants, notably the states of anxiety and mood changes.

Cognitive factors

The table 4 illustrates also non parametric correlations among measures of cognitive factors, i.e. the sense of control on the therapy and different coping strategies.

The different coping strategies resulted associated in different ways to perception of therapeutic efficacy, that is the sense of control of the illness. The latter augments when the individual adopts a action of facing the problems (situational coping) and diminishes if the person uses a strategy centered on emotions (emotive coping). No meaningful correlation is visible in the use of a strategy meant to avoid the problem. This strategy correlates peculiarly both with the use of strategies centered on the problem, but also with the use of strategies centred on emotions, to under-

line both the non exclusivity of a strategy respect to the other, and the meaning itself that the escapement of the problem assumes: in a short term avoiding the problem assumes an adaptive meaning, on a long term the strategy becomes dysfunctional (59).

Socio-relational factors

At last the variables related to socio-relational factors have been considered and in particular the social support the person perceives to receive by friends/relatives and care givers. Part of the analysis is also the perceived satisfaction by patients about assistance received by nurses (Table 4). The indexes of correlations make notable how the more the participants felt supported by nurses and by friends and relatives the more are also satisfied for the cares received. The highest correlations between the perceived support by nurses and the social support received at whole seem to state how the perception of being supported even by the informal network (friends and relatives) and how both connect one to the other to satisfaction for the received cares.

The influence of clinical, emotive, cognitive and socio-relational variables on therapeutic adherence

In a second time it was measured if factors previously described differentiated themselves in function of the three levels of adherence found (highly, middle, scarcely adherent), by the non parametric test of Kruskal-Wallis. illustrates the differences of the clinical variables in function to the level of adherence of the participants. In order to make much clear the result are reported the medium values instead of the ranks (table 5).

In terms of clinical variables, the result of the test illustrates how only the presence of the angina symptomatology [χ^2 (2) = 6.09; p = .043] and breath related [χ^2 (2) = 11.21; p = .008] varies significantly in function of the level of declared adherence. No difference in function of the levels of adherence matches instead relating to the fact to have in the past already a heart attack and relating to the subjective perception of the limitations that the illness means. As it is notable the two clinical symptoms augmentate progressively when diminuishing the levels of adherence. Post-hoc com-

Table 5. The influence of clinical factors, emotive, cognitive and social-relational levels on therapeutic adherence (Mann-Whitney's U)

Factors	Levels of therapeutic adherence	Low (N =10)		Middle (N = 21)		High (N = 53)	
		M	DS	M	DS	M	DS
Clinical	1 Myocardial infarction (1 = yes)	1.80	0.42	1.62	0.50	1.57	0.50
	2 Comorbility	6.60	2.07	6.10	3.25	5.47	1.72
	3 Dyspnea	3.48[a]	1.66	2.11[b]	1.69	1.75[b]	1.32
	4 Angina	3.13	1.13	2.89[a]	.81	2.50[b]	.49
	5. Limitation due to heart symptoms	2.83	1.47	2.88	1.96	2.30	1.50
Emotive	1 Negative emotional representations of illness	5.51	1.76	5.88[a]	1.90	4.73[b]	1.82
	2 Perception of illness as an identity threat	3.73[a]	0.85	3.80[a]	1.02	2.94[b]	0.76
	3 Anxiety	6.30[a]	3.56	5.86[a]	3.84	3.21[b]	3.00
	4 Sadness	4.20[a]	4.08	3.67[a]	3.37	1.57[b]	1.60
Cognitive	1 Control on the treatment	3.46[a]	1.22	3.83[a]	1.04	4.74[a]	1.16
	2 Coping based on problem/situation	2.74	1.42	2.76[a]	1.27	3.48[a]	1.36
	3 Coping based on emotions	3.19[a]	1.18	2.90[a]	1.34	2.22[b]	0.95
	4 Coping based on avoidance	2.81	1.53	2.30	0.95	2.85	1.20
Social-relational	1 Relatives, friends and partners social support supplied	4.13[a]	1.32	4.55[a]	1.37	5.33[b]	1.03
	2 Health professionals (nurses) social support supplied	4.10[a]	1.15	4.79	1.17	4.97[b]	1.08
	3 Satisfaction for cures by nurses	4.48	1.16	4.75	0.94	5.14	0.96

[a, b]: post-hoc comparisons; Mann-Whitney's U, p < .05

parisons, realized by the non parametric test with N 2 samples U di Mann-Whitney) have made evident that the dyspnea of the participants with low adherence is significantly much higher than the one reported by patients with a average [Z = -2.20, p = .031] and a high adherence [Z = -3.40, p = .000]. The subjects with a middle adherence report, moreover, symptoms of (angina) significantly much higher than those with high adherence [Z = -2.14, p = .029].

Relatively to *emotive variables*, is notable that psychological symptoms of anxiety [χ^2 (2) = 10.51; p = .005] and of sadness [χ^2 (2) = 8.26; p = .015], the fact of feeling one self menaced by the illness at a identity level [χ^2 (2) = 16.24; p = .000] and also tend to experiment a negative emotive state due to the illness [χ^2 (2) = 5.19; p = *.068*] and are significantly differentiated in function of the levels of adherence. Post hoc comparisons have made notable that subjects with a low or middle adherence tend to feel anxiety [Z_{Bassa_a} = -2.46, p = .010; Z_{Media_a} = -2.46, p = .010], sadness [Z_{Bassa_a} = -2.07, p = .037; Z_{Media_a} = -2.40, p = .016] and much more menaced by the illness [Z_{Bassa_a} = -2.80, p = .005; Z_{Media_a} = -3.43, p = .001] than to those with a high adherence. The subjects with a middle adherence are differentiated by those with a high adherence in experimenting negative emotions bound to the illness [Z_{Media_a} = -2.25, p = .023].

Also some of the cognitive variables, specifically the sense of control on the therapy [χ^2 (2) = 13.16, p = .001], the coping centred on the problem [χ^2 (2) = 5.98, p = .045]and on the emotions [χ^2 (2) = 7.95, p = .018], show scores significantly different in function of the three levels of adherence. No difference is detected for the coping based on escapement. Post hoc comparisons made notable, even in this case, that subjects with a low or middle adherence tend to argue to have a smaller sense of control on the illness [Z_{Bassa_a} = -2.58, p = .008; Z_{Media_a} = -2.90, p = .003], to use less strategies centred on the task [Z_{Bassa_a} = -1.62, p = .104; Z_{Media_a} = -2.13, p = .032] and more strategies centred on the emotions [Z_{Bassa_a} = -2.43, p = .015; Z_{Media_a} = -1.99, p = .048] than those with a high adherence. It is interesting remarking how, even if recording differences only close to a statistical significance [Z_{Media_a} = -1.82, p = .070] the strategies based on escapement are used much often by patients with a high adherence than by those with a middle adherence.

At last, is notable by table 5 how the support mainly by friends and relatives [χ^2 (2) = 11.82, p = .002] tend to differentiate itself in function to the declared levels of adherence. A trend to statistical significance is recorded anyway also for the social support of the nurses [χ^2 (2) = 5.28, p = .070] and the satisfaction for the received cares [χ^2 (2) = 5.40, p = .062]. Post hoc comparisons have highlighted that the patients with a low or middle adherence receive less social support by friends, relatives or other proxies than those with a high adherence [Z_{Bassa_a} = -3.12, p = .001; Z_{Media_a} = -2.26, p = .024] and those with a low adherence state to have received less social support by health professionals [Z_{Bassa_a} = -2.28, p = .020] than high adherence. Notwithstandly the differences don't reach the level alpha di .05, is possible to notice that the participants with a high level of adherence tend to consider themselves more stasfied for the received cares than the patients with a low [Z = -1.86, p = .060] and middle [Z = -1.76, p = .079] adherence.

Discussion

As we have previously argued, the patogenesis, prognosis and recurrent of IMA are strongly correlated to life styles, therefore the adherence to prescriptions is needed to reduce the heart risk factors, to avoid health problems and the quality of life for heart patients (20). In the analysis of factors associated to such adherence, through a self-report questionnaire supplied to 84 people with acute coronary syndrome, is confirmed the multifactoriality of the phenomenon as present in the literature (18-20).

Results indicate, in fact, the influence of *clinical variables*, showing peculiarly that patients suffer more of dyspnea and angina symptoms than those that state to follow prescriptions (30).

The results of this research have moreover made notable that neither the fact of having already have a heart attack, nor the co-morbidiity are associated to the adherence to prescriptions. This result seems to be interpretable as a missed perception of the therapeutic treatment (60), contributing to the perception that the benefits of adherence don't overcome the advantages (65).

Also the *emotive* aspects seem able to interfere a lot with the adherence. The results of this research confirm that are in particular the subjects scarcely adherent those that feel more menaced at an identity level by their illness, that they cope with it much intensely by the point of view of negative emotions felt and that experiment more symptoms of anxiety and changes of mood than highly adherent patients. As the literature has widely made notable, such emotive states are associated to the heart illness non only by the direct (pathofisiological effects), also through behavioral mechanisms related to unhealthy life styles that become risk factors as an unregular diet, absence of fitness, abuse of drugs, smoking (25, 27, 28, 61, 62). These risk factors, consequentially, facilitate the recurrent (29, 63) and the adverse events (65) and can obstacolate the adherence to therapeutic prescriptions, limiting the worries of patients about the importance of their own health behaviours (30, 31). The results of this study seems moreover to confirm that is important in the evaluation of the heart patient, don't be untrusting only on clear diagnosis of high depression (64), but also to refer to a complex emotive and cognitive frame of the patient (66).

At a *cognitive* level the results made notable that adherent patients put into achieve coping strategies not centred on emotions, but headed to the solution of the problem. These results confirm how these subjects perceive mostly the self-efficacy in the therapeutic treatment (37). The coping centred on the problem appeals to, in fact, active strategies, goal planning, analysis of past experience, research of social support and information. The coping centred on emotions have, instead, as fundament the pursuit of strategies that don't modify the relationship with the stressor, but the meaning and the emotive reaction that this stirs up (35, 67, 68-71). Also other modalities of coping, such as the escapement, take to negative results for the health (36, 72, 73). Therefore, as confirmation to the literature (18), also the results gained in this research make notable that the strategies of coping based on escapement have tended to be much adopted by patients scarcely adherent, than others.

At *socio-relational level* is confirmed, as present in the literature (41), the importance of the social support in favouring the adherence. This support results peculiarly important when it comes from the family, the network of friends and affectivities (38), but also from the nurses (40). On the line to results found in the literature these data confirm that the social isolation and low levels of social support perceived don't take to opportune outcomes for illness, imagining that the low adherence can not only augment the risk of recurrent (42, 44, 45, 47), but also foster the death rate of the subjects with a heart illness (41, 48). Even though only with a trend to statistical significance, the results stress also that the satisfaction for the received cares tends to affect to the adherence to prescriptions; this can be explained by the importance of the communication between the staff and patient, by an improvement of the schema of treatment, the adoption of scheduled follow ups and interventions of counselling that all resulted correlated to the adherence to prescriptions (74). In synthesis, in substantial agreement with the results of the literature (75), this research have highlighted that less adherent subjects underestimate also the acuteness of the illness and the efficacy of treatment, are less trustful in professionals, perceive a reduced social support, experience emotive states and invalidating clinical symptoms and put themselves at risk of their own health. Among the different factors here considered has anyway rosin up that those psychological and relational tend to be associated to level of adherence for prescriptions, rather than those clinical and the socio-personal.

Such outcome does not confirm in part former researches, showing how the socio-personal variables and those clinical result being tightly associated to the adherence (19); on the other hand this confirms instead the importance of psycho-social factors, as already notable in the literature in heart studies (20-22).

Implications

The implications of this research on the assistance and clinical side, having the results in agreement to the literature, are therefore to cast in the involvement of the nurses, the accurate evaluation of the levels of adherence of patients with SCA, with the goal to intervene on possible psychological, cognitive and relational boarders, obstacoling the inter-

action and communication. In order to adherent, the patient and the family need to be informed and participate to the care project, and the communicative and relational styles by care givers can't be apart to consider the characteristics of the patient and its life context (51, 65). Because the adherence to therapeutic treatment is influenced by the environment where the patient lives, by healthcare providers and by the care system, is therefore necessary a multifactorial and symultaneous intervention involving the different actors of the path of care for the patient (76) and that adopts of early follow-up off the hospital (77). There are different projects that have tested the efficacy of structured programs of health education, mostly coordinated by nurses, and headed to modify life styles and the adherence to drug therapy. For example the study GOSPEL (77) demonstrated that an intervention (long-term intensive rehabilitation), instead of a (traditional assistance program), is much efficacious in modifying the adherence to therapy. Even the program RESPONSE (78) has notably shown that a program managed by nurses involved in heart related illness prevention is as much efficacious as concretely realizable in different healthcare systems. The development of programs with nurse management has demonstrated a great success in terms of survival and reducement of the average recovery time span (79). Personal care path instead to normal methods (much generalized) have resulted much efficacious in developing in the patients behaviours headed to the self management of physical training (80), in reducing hypercholesterolemia (81)and the addiction to smoking (82); the training meetings run by nurses have improved the knowledge of the illness and the awareness of the benefits of a right life style to prevent the worsening of conditions (83).

Side prevention programs until now enacted have anyway a great limit in being put into achieve as physical trainings or training programs in terms mostly clinical, overlooking the psychosocial and relational factors that, as this research has widely demonstrated, often are relevant factors in conditioning the "adherent" behaviour of patients; it is towards such approach that such programs should be geared.

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Accepted: 21 May 2014
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