



ORIGINAL ARTICLE

Psychophysical health of elderly inpatients in cardiac rehabilitation: a retrospective cohort study

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ABSTRACT

BACKGROUND: Elderlies in cardiac rehabilitation show a particular frailty due to specific aging issues, thus specific professional psychophysical care is required.

AIM: This study aimed at evaluating the effect of a cardiac rehabilitation program enhanced with psychological support on the psychophysical health of elderly subjects aged ≥ 75 . Moreover, the association of psychophysical conditions with the long-term post-discharge course of medical events was examined.

DESIGN: This retrospective cohort study was conducted on elderly patients aged ≥ 75 admitted from 2015 to 2019 to a cardiac rehabilitation program including psychological support.

SETTING: The cardiac ward and the psychology unit of a post-acute clinical rehabilitation Institute.

POPULATION: A total of 523 elderly inpatients (44% females), aged ≥ 75 years (mean 79.7 ± 3.46 years), admitted to a cardiac rehabilitation ward due to heart disease.

METHODS: Psychological and functional variables such as depression, quality of life, and Barthel Index were measured at hospitalization and at discharge. The medical events after discharge such as emergency department accesses and rehospitalizations were registered.

RESULTS: Cardiac rehabilitation showed significant improvements both in elderlies' psychological and physical health. Higher depression levels predicted a worse post-discharge course. Patients who received psychological intervention accessed emergency department and were rehospitalized significantly later than the others.

CONCLUSIONS: Cardiac comprehensive rehabilitation can significantly improve the psycho-physical health of elderly subjects aged ≥ 75 who benefit of psychological support. Psychological support can enhance the psychophysical health of great elder inpatients in cardiac rehabilitation.

CLINICAL REHABILITATION IMPACT: Given the associations with short and long-term outcomes, health professionals should take care of the psychological conditions of elderlies (e.g., depression) by integrating psychological interventions in cardiac rehabilitation in order to promote the elderlies' psychophysical conditions, quality of life, as well as more favorable medical outcomes.

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KEY WORDS: Aged; Cardiac rehabilitation; Mental Health; Health; Psychotherapy.

The European population is progressively aging and in 2030 the proportion of elderly over 65 years will almost double, up to reaching almost 152.6 million in 2060.¹ Progressive aging is associated with an increased burden of cardiovascular diseases that requires coping with various illness-related issues, both physical and psychological.^{2,3}

Furthermore, medical issues in interaction with various psycho-social factors may aggravate the condition of elder cardiac patients, such as by hampering the lifestyle improvement, and thus impeding the adherence to optimal therapy.⁴

Beyond their medical condition, elderly people suffer, in fact, of specific and important psychosocial and

financial issues, which burden is even greater for elderlies ≥ 75 years. As for instance, widowhood is very common among elderlies over 65 years, involving 51% of women and 13% of men.⁵

Regarding elderlies with cardiac disease, evidence showed an association between lack of social support (e.g., relatives, friends, religious networks) and increased morbidity and mortality⁶ that are also affected by depression.^{7, 8} Among older patients, depression is common, from 10% up to 15% of them are depressed, and 20% of them presents noteworthy anxiety symptoms.⁹

Conducting a depression assessment in elderly patients allows offering them the most appropriate and effective treatment to reduce depressive symptoms and to improve quality of life.¹⁰

Given such evidence, a comprehensive cardiac rehabilitation (CR) program including various core components, such as physical exercise, management of cardiovascular risk factors, optimization of medical therapy, nutritional, psychological and social counseling is recommended for cardiovascular patients and elders in particular.¹¹

In fact, among secondary prevention, CR is a comprehensive and long-term program recommended for patients with coronary heart disease, heart failure, undergoing coronary aortic bypass grafting (CABG), valve replacement or repair, heart transplantation, and implantation of devices.^{12, 13}

Epidemiological data referred to CR programs show that the number of patients aged over 75 years is increasing.¹⁴

Furthermore, interesting studies demonstrate that, after CR programs, older patients show improvements in exercise tolerance and in self-reported physical function, at least similar, and sometimes greater, level than adult patients.¹⁵⁻¹⁷ Positive repercussions regarding improved physical health and lower sanitary and social costs are evident.¹⁸

Some authors point out that psychological support may be fundamental to improve psycho-physical health outcomes and quality of life of elderlies with cardiac disease,¹⁹ and this is confirmed by current European guidelines that recommend the use of distinct psychological interventions adjusted to the needs of the individual patient.²⁰ Different studies have investigated the additional effect of psychological interventions on quality of life, anxiety, and depression in a CR setting, thus showing the usefulness of psychological interventions in improving quality of life.²¹ A recent meta-analysis reported that psychological interventions during CR program may reduce depressive symptoms, but the effect on anxiety, quality of life and cardiovascular events and the outcome it is still not clear.²²

Of interest, evidence suggested that psychological interventions might have a positive result in a vulnerable population affected by the cardiac disease.²³ However, almost all of the studies focused on psychological interventions and CR mainly involved only patients whose mean age is lower than 65 years old.²⁴

In the literature, few studies investigated the psychological health of over 75 elderlies undergoing CR.²⁵

Therefore, this retrospective cohort study describes the peculiarities of a sample of elderlies over 75 years old who underwent a CR program that usually lasts for a minimum of two weeks up to 1 month.

Therefore, this study aimed at: 1) describing the psychological and social characteristics of elderly patients in CR; 2) exploring the impact of psychological and social characteristics on long-term outcome; 3) investigating the effect of a CR program, enhanced with psychological support, on the psychological stress and on the medical long-term events (*i.e.* rehospitalization and emergency department accesses).

Materials and methods

In this study, an observational retrospective cohort design was used, the recommended STROBE guidelines were followed.^{26, 27}

Data were collected from 2015 to 2019 in a rehabilitation hospital in the north of Italy. Inclusion criteria were: age equal to or higher than 75 years; being an Italian speaker; absence of sensorial, physical, or psychiatric pathologies preventing from the psychological assessment and/or questionnaires' administration. Figure 1 shows the study flow diagram.

Specifically, the Unit of Psychology-Neuropsychology recruited patients (N.=523, females 44%; mean age 79.27 ± 3.46 years) who were progressively admitted to the Unit of Cardiology to undertake CR. Complete data of the sample participants are reported in Table I.

The CR program relied upon the work of a multi-professional team including physicians, psychologists, physiotherapists, speech therapists, dietitians, and professional nurses. The rehabilitation process was mainly addressed to patients, however, also their caregivers may be involved given their key role in supporting patients. The psychological, social and medical condition of each patient was evaluated, in order to select patients with the higher distress or showing difficulties (psychological or behavioral) in facing their health condition. Thus, during the rehabilitation program, a part of patients (N.=128) received psychological

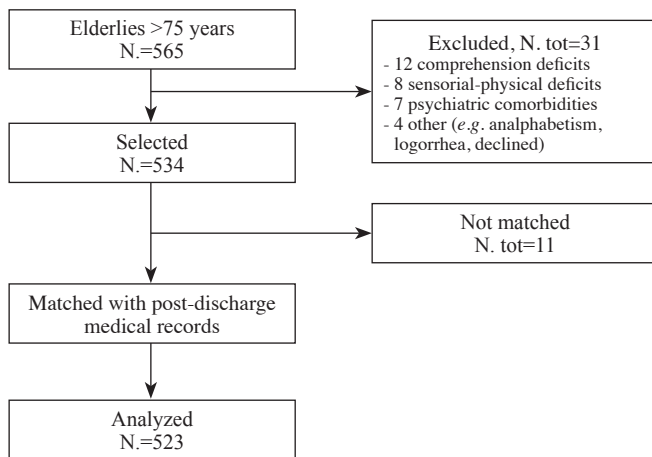


Figure 1.—Study flow diagram.

treatment (PT) that was specifically tailored and adapted to each individual's needs, thus not standardized. Given that elderly inpatients in rehabilitation often suffer of demotivation, lack of commitment, fatigue and apathy,²⁸⁻³⁰ the psychological intervention aimed at improving patients' self-efficacy, motivation, and cooperativeness with the rehabilitation goals and at supporting caregivers to cope with the situation.^{31, 32} The most frequently used psychological techniques were mainly psychological and emotional support, relaxation, and reinforcement of coping strategies. The PT was delivered by psychologists who were also psychotherapists with a cognitive-behavioral approach.

The Unit of Psychology-Neuropsychology collected demographic and psychological data of patients who were individually assessed both at hospitalization (T1) and discharge (T2). The outcomes were measured consistently and using the same criteria.

The Unit of Bioengineering matched the collected data with the medical records from the Cardiology Unit and further regional data concerning the post-discharge medical events course, consisting in all emergency department accesses and re-hospitalizations not only cardiac-related. The research protocol of this cohort retrospective study was conducted with the approval of the Scientific and Ethic Committee of the Institute. As routine procedure of the Scientific Institute, at the admission all participants voluntarily signed the informed consent to use their data.

Measures and instruments

Between the second and the third day from hospitalization, patients were individually administered different measure instruments. The assessment was repeated at discharge.

TABLE I.—Characteristics of the sample.

Characteristics	Total (N.=523)	Female (N.=228)	Male (N.=295)
Age, years			
Mean±SD	79.27±3.46	79.84±3.58	78.83±3.3
Range	75-94	75-94	75-89
Education, years			
Mean±SD	7.25±3.41	6.7±3.04	7.62±3.61
Range	5-18	5-18	5-18
5 years	305 (58.3%)	148 (64.9%)	157 (53.2%)
8 years	117 (22.4%)	40 (17.5%)	77 (26.1%)
13 years	75 (14.3%)	29 (12.7%)	46 (15.6%)
18 years	16 (3.1%)	3 (1.3%)	13 (4.4%)
Marital status			
Married	300 (57.4%)	78 (34.4%)	222 (75.3%)
Divorced	16 (3.1%)	5 (2.2%)	11 (3.7%)
Widowed	168 (32.1%)	127 (55.7%)	41 (13.9%)
Not married	36 (6.9%)	17 (7.5%)	19 (6.4%)
Medical pathology			
Bypass	95 (18.2%)	27 (11.8%)	68 (23.1%)
Valvular	186 (35.6%)	105 (46.1%)	81 (27.5%)
Bypass + valvular	64 (12.2%)	19 (8.3%)	45 (15.3%)
AMI	32 (6.1%)	13 (5.7%)	19 (6.4%)
PTCA	34 (6.5%)	11 (4.8%)	23 (7.8%)
Heart failure	23 (4.4%)	11 (4.8%)	12 (4.1%)
Check-ups	10 (1.9%)	5 (2.2%)	5 (1.7%)
Other	62 (11.9%)	28 (12.3%)	34 (11.5%)

AMI: acute myocardial infarction; bypass: heart bypass surgery; PTCA: percutaneous transluminal coronary angioplasty; valvular: valvular heart surgery.

The Mini-Mental State Examination (MMSE)³³ is a handy measure of cognitive impairment ranging from 0 to 30 with higher values expressing higher cognitive functioning. In the Italian population, a score lower than 26 indicates mild cognitive difficulties, with a score of 18 and lower indicating severe cognitive impairment.

The Geriatric Depression Scale Short Form (GDS)³⁴ is a 15-item self-report questionnaire with a dichotomous format to measure depression in elderlies. Scores range from 0 to 15, with values from 6 to 15 indicating increasing levels of depression.

The three-level EuroQoL-5-Dimensions (EQ-5D)³⁵ is a measure of subjective health-related quality of life (QoL) across five areas (*i.e.*, mobility, self-care, usual activities, pain/discomfort, and anxiety/depression): lower scores reflect a higher QoL. The EuroQoL-VAS is a Visual Analog Scale to express the perceived quality of life from 0 to 100 (better health perceived).

The Barthel Index,³⁶ administered by physiotherapists, is a measure of independence in activities of daily living (ADL). It ranges from 0 (totally dependent) to 100.

Ejection fraction (EF) is a percentage measurement of how much blood the left ventricle pumps out with each

contraction and can help to track heart functioning: lower EF values indicate lower functioning.

Information about the post-discharge events of patients was retrieved by the regional health system, and namely:

- the number of days between discharge and the first access to emergency department;
- the rate of emergency department accesses (EDA) after discharge;
- the number of days between discharge and the first re-hospitalization;
- re-hospitalizations (RH) rate after discharge.

Statistical analysis

Descriptive statistics provided a description of the sample, and the Pearson correlation coefficient evaluated associations among variables. In order to evaluate the effect of the rehabilitation treatment, paired *t*-tests were used comparing measures (GDS, EQ-5D, MMSE, Barthel Index) from hospitalization to discharge. Cox regressions compared as the number of days from discharge to EDA and to the first RH between the group with and without psychological intervention. Linear regressions models evaluated the variables' predictive effect on medical events after discharge. The alpha level was set at .05. The statistical analyses were conducted with the SPSS statistical software v. 20.

Results

As shown in Table I, for the total sample (N.=523) the mean age was 79.27±3.46, with no significant difference between males (N.=295) and females (N.=228). The majority attended 5 years of school (58.3%) with a mean of 7.25±3.41 years of education. Participants were mostly married (57.4%), followed by widowers (32.1%). The largest part of the subjects underwent a surgical procedure (66%), such as by-pass (18.2%), valvular surgery (35.6%), or both of them (12.2%). A consistent part of the sample (17%) suffered from acute myocardial infarction (AMI, 6.1%), or underwent percutaneous transluminal coronary angioplasty (PTCA, 6.5%), or

had heart failure (HF, 4.4%). About 11.9% of patients were hospitalized for other reasons, like atrial fibrillation, or congenital pathologies leading to cardiac sufferance.

Comparing the measures at admission and discharge (Table II), a positive effect of the rehabilitation treatment on depression, quality of life, cognitive functioning, and ADL was found (all P<0.001). Depression rate, as measured with GDS, showed a relevant reduction from admission to discharge (29.3% and 12.7%, respectively).

Regarding depression scores, treated patients showed a significant improvement in their depression score from hospitalization to discharge (P<0.001). The depression improvements of patients assigned to the PT group were smaller than those of the non-PT group, possibly given that they were those with a more complex condition. As expected, patients who were not dedicated a specific psychological intervention resulted to be less depressed than treated patients (P<0.05) thus confirming the suitable selection performed by psychologists in focusing the intervention on the neediest ones (Table III). However, both groups reported significant improvements in depression scores thus showing the overall efficacy of CR (P<0.001).

Concerning the perceived health-related QoL in its five dimensions, rehabilitation had a positive effect enhancing the general perceived quality of life in both psychologically treated and not treated patients. In particular, PT patients showed the same level of improvement than not treated patients.

Undoubtedly, a better performance in ADL substantially contributed to these results. In fact, at discharge the Barthel index showed low but significant correlations (all P<0.001) with depression ($r=-0.20$) and quality of life (EQ-5D: $r=-0.286$; VAS: $r=0.196$).

Then, examining regional data allowed to study the long-term outcomes of over 75 elderlies after discharge. Results are displayed in Table IV and Table V.

Considering medical events occurred up to one year after discharge, the Cox regressions showed that the not-PT group reported higher hazard ratios (HR) to access emer-

TABLE II.—Effect of rehabilitation: paired *t*-test.

Parameter	Hospitalization (T1)	Discharge (T2)	Δ(T2-T1)	<i>t</i>	P value	Hedge's g
GDS	4.65±2.97	3.48±2.87	-1.177	9.626	<0.001	0.40
EQ-5D	9.98±2.26	7.24±1.74	-2.043	23.123	<0.001	1.35
VAS	52.03±21.65	71.68±17.73	19.658	-14.869	<0.001	0.99
MMSE	24.83±2.81	26.39±2.43	1.56	-11.008	<0.001	0.59
BI	71.96±17.1	94.36±11.79	22.402	-33.041	<0.001	1.52

GDS: Geriatric Depression Scale; EQ-5D: EuroQoL five dimensions; VAS: Visual Analogue Scale of EQ-5D; MMSE: Mini-Mental State Examination; BI: Barthel Index.

TABLE III.—Effect of the rehabilitation in PT group and the no-PT group.

Parameter	Hospitalization (T1)	Discharge (T2)	Δ(T2-T1)	t	P value	Hedge's g
PT group						
GDS	4.58±3.17	3.52±3.20	-1.06	4.29	<0.001	0.33
EQ-5D	9.82±2.35	7.22±1.92	-2.60	12.97	<0.001	1.20
VAS	55.37±20.23	71.99±17.43	16.62	-7.16	<0.001	0.87
MMSE	24.87±2.85	26.22±2.54	1.34	-4.99	<0.001	0.49
BI	72.76±15.61	94.88±9.42	22.11	-17.843	<0.001	1.71
No-PT group						
GDS	4.69±2.82	3.46±2.73	-1.23	8.907	<0.001	0.44
EQ-5D	10.05±2.22	7.25±1.66	-2.81	19.16	<0.001	1.42
VAS	50.52±22.14	71.55±17.91	21.02	-13.12	<0.001	1.04
MMSE	24.82±2.80	26.47±2.38	1.66	-9.97	<0.001	0.63
BI	71.71±17.56	94.20±12.46	22.49	-28.02	<0.001	1.47

PT: psychological treatment; GDS: Geriatric Depression Scale; EQ-5D: EuroQoL five dimensions; VAS: Visual Analogue Scale of EQ-5D; MMSE: Mini-Mental State Examination; BI: Barthel Index.

TABLE IV.—Long-term outcomes: Cox regression at one year.

No-PT vs. PT group	B	SE	Wald	P value	Exp(B)
Days to first EDA	0.547	0.159	110.839	<0.001	1.728
Days to first RH	0.772	0.177	160.600	<0.001	2.058

PT: psychological treatment; EDA: emergency department access; RH: rehospitalization.

gency department (HR=-1.728, P<0.001) and of being re-hospitalized (HR=-2.058, P<0.001) earlier than the PT group, as shown in Figure 2. In fact, the PT-group patients accessed emergency department and were re-hospitalized significantly later than subjects in the non-PT group, who faced these medical events earlier.

TABLE V.—Long-term outcomes: events rate.

Sample	Predicted	Predictors	Beta	t	P value	Model
Total sample	EDA rate	Depression	0.187	3.247	0.001	R ² =0.049; F=7.464 P=0.001
		EF	-0.126	-2.185	0.030	
	RH rate	Depression	0.192	3.397	0.001	R ² =0.080; F=12.590 P<0.001
		EF	-0.214	-3.789	<0.001	
No-PT group	RH rate	EF	-0.182	-2.599	0.010	R ² =0.33; F=6.756 P=0.010
PT group	EDA rate	VAS	-0.283	-2.800	0.006	R ² =0.80; F=7.840 P=0.006
		Depression	0.352	3.674	<0.001	
	RH rate	EF	-0.242	-2.525	0.013	R ² =0.182; F=9.871 P<0.001
		Depression	0.312	4.155	<0.001	
Males	EDA rate	Depression	0.312	4.155	<0.001	R ² =0.097; F=17.260 P<0.001
	RH rate	Depression	0.289	3.840	<0.001	R ² =0.104; F=9.233 P<0.001
		EF	-0.159	-2.101	0.037	
Females	EDA rate	EF	-0.232	-2.694	0.008	R ² =0.054; F=7.256 P=0.008
	RH rate	EF	-0.298	-3.522	0.001	R ² =0.089; F=12.405 P<0.001
		Depression	0.145	2.060	0.041	
Surgical	EDA rate	Depression	0.145	2.060	0.041	R ² =0.021; F=4.243 P=0.041
	RH rate	EF	-0.192	-2.747	0.007	R ² =0.037; F=7.547 P=0.007
		VAS	-0.228	-2.194	0.031	
Non-surgical	EDA rate	VAS	-0.228	-2.194	0.031	R ² =0.052; F=4.815 P=0.031
	RH rate	Depression	0.325	3.219	0.002	R ² =0.105; F=10.361 P<0.002

EDA: emergency department accesses; EF: ejection/fraction; RH: re-hospitalization; PT: psychological treatment.

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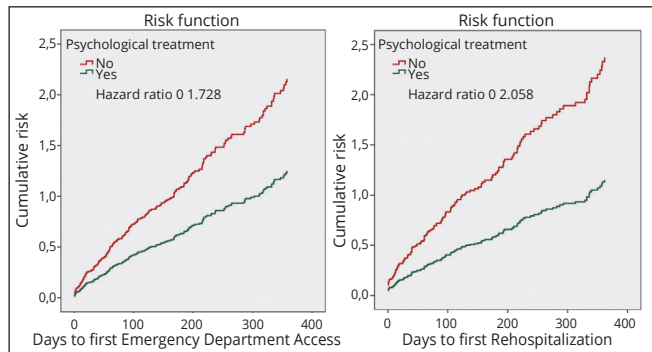


Figure 2.—Long-term outcomes: hazard ratio at one year.

An interesting result concerning patients living alone is that they accessed the emergency department significantly earlier than patients who do not live alone ($P < 0.05$).

Linear regressions models with stepwise method tested which variables significantly predicted the course of medical events after discharge; the predictors taken in consideration were EF, Barthel Index, GDS, EQ-5D, VAS, and MMSE measured at discharge (Table V).

Across results, higher depression levels predicted a worse post-discharge medical course, whilst higher EF values were associated with a more favorable medical course.

In particular, in PT patients higher depression levels resulted to be a stronger predictor of re-hospitalizations than EF. Conversely, for not-PT patients, EF resulted to be the major predictor of re-hospitalizations, a higher EF was associated with less rehospitalizations.

Considering gender differences, for males, higher depression scores at discharge from rehabilitation significantly predicted a higher number of emergency department accesses. In the same way, for males, depression score at discharge and EF resulted to be significant predictors of re-hospitalization rate. For females, only EF significantly predicted both lower emergency department accesses and lower re-hospitalization rates.

Comparing surgical (valvular and bypass procedures) and not surgical patients (MI, PTCA, HF, other), for the first group depression was the main predictor of emergency department accesses, while for RH rate EF was the main predictor. In the not-operated group, VAS at discharge predicted the number of emergency department accesses, while depression predicted re-hospitalization rate.

Discussion

In this study, we investigated the psychophysical health of over 75 elderlies in CR program enhanced with psycho-

logical support. Moreover, the psychophysical health and the medical long-term events were analyzed.

An interesting observation from our sample concerns a consistent part of patients showing at hospitalization: a high depression rate; a low level of ADL; and a perceived poor quality of life. This result is in line with cardiological literature that reports depressive symptoms, and low perceived quality of life in elderlies with cardiac diseases.³⁷ However, in our study patients showed significant improvement in all these areas at discharge. In fact, the rehabilitation program led to significant psychological improvements both for the PT and for not PT patients, even if subjects receiving PT were those with a more complex condition.

The positive effect of CR for elderlies is visible, but limitations of observational designs should be reminded to not improperly infer causality. The elderlies' condition was improved under various perspectives: psychological, cognitive, and physical. In this sense, CR represents a powerful secondary prevention tool to improve the general health conditions of elderlies over 75 years.³⁸

In addition, patients living alone faced the worst health-course: they accessed emergency department significantly earlier than patients who did not live alone. Especially after widowhood, men seem to be less prone than women to socialize.³⁹ Evidence showed that strengthening the patients' relationships with caregivers and with the social network is associated with better psychophysical health.^{40, 41} Thus, during rehabilitation, health professionals – psychologists and social workers in particular – may strengthen the involvement and collaboration of the medical and social network around the patient, in fact, social support represents a fundamental and protective resource.^{42, 43}

Then, studying the health-related course of medical events after discharge allowed to highlight the associations with the relevant psychophysical aspects in elderlies that deserve careful consideration by health professionals.

In this regard, results show that higher depression levels at discharge were significantly associated with a higher number of re-hospitalizations after discharge.⁸ This is particularly true for males whose depressive symptoms were significant predictors of future medical events. As some authors underline, men seem to be culturally driven to ignore physical discomfort, thus avoiding to seek medical care for perceived symptoms, and for this reason they receive treatment when their medical condition is more advanced.⁴⁴

An important observation concerns the non-operated patients: their psychological condition (*e.g.*, depression and perceived quality of life) predicted their health-outcomes respectively in term of more emergency depart-

ment accesses and more re-hospitalizations. The severity of medical conditions affecting non-operated patients can frequently generate emotional reactions of fear and denial of the illness,^{19, 45} reducing individual's coping skills, and resulting in poorer health outcomes.⁴⁶ On the other hand, for operated patients EF predicted the re-hospitalization rate, and depression negatively predicted the emergency department accesses. If the former result has an evident medical explanation, less obvious is the negative relationship between depression and emergency department accesses. In line with Rief *et al.*,⁴⁷ could be hypothesized that operated patients have high expectations in the postoperative phase, and when other symptoms occur, they develop frustration, thus losing confidence in medical help. Considering the opportunity to measure expectations pre- and post-surgical procedure may be useful.

Qualitative research methods, such as individual interviews, examining the subjective psychological experience over time, may be useful to understand how to address patients' expectations.

Overall, results show that, given the association of depression and EF with the post-discharge medical event course, health professionals should consider both the psychological and physical condition of subjects aged over 75 in order to provide them with the best rehabilitation program tailored on their individual needs.

Despite the consistent findings, during interpretation of conclusions attention should still be paid on the limitations of a retrospective observational cohort study design. Indeed, a direct comparison with patients without rehabilitation program was not possible. Similarly, the non-randomized and unbalanced distribution of patients in the PT group limits any conclusion on the PT effects. Thus, the results of the above cohort study can suggest only association and not causation. Regarding potential bias, the outcome of medical events after discharge may be affected by unmeasured confounders and uncontrollable factors, such as previous health conditions and/or other treatments. Despite these limitations, retrospective cohort designs can still offer a more integrated representation of the existing evidence and could contribute strengthening the current public health practices. Concerning results generalizability, results of our study conducted in one rehabilitation center in northern Italy should be cautiously extended to different geographic areas, future multicentric studies should provide stronger evidence about.

Among further research topics, the role of PT in improving elderlies' outcomes should be further investigated by means of randomized controlled treatment (RCT) stud-

ies comparing various treatments. Issues as living alone, the emotional trend over time, preoperative and/or pre-rehabilitation expectations have to be furtherly investigated. Moreover, given that our sample included only elderlies suffering of cardiac diseases, thus future studies should test the generalizability of these results also to other medical diseases.

Conclusions

In recent decades, literature pointed out the importance of caring for elderlies' physical and psychological health.⁴⁸ Psycho-physical health has become a first-order issue for elderlies, and particular clinical attention should be focused on subjects with cardiac pathologies.^{49, 50} Comprehensive CR may represent the best way to address physical and psychosocial needs for the elderly people.^{51, 52} In particular, given the frequency of apathy and depression among elderly patients,³⁷ they may not be able to seek and require professional psychological help,^{53, 54} thus, psychological assessment and support should be a regular part of CR in order to improve psychophysical health outcomes. Furthermore, psychological intervention, as part of CCR, may consistently improve the effectiveness of the whole program.

By improving the patients' emotional experience, cognitive style, and resources,^{55, 56} psychological support can reinforce adherence to treatments and reduce the occurrence of psychological issues, thus catalyzing the overall positive effect of rehabilitation also on the long-term outcomes.⁵⁷⁻⁵⁹

Our results provide evidence of the need to assess and follow up elderly cardiac patients from a psychological point of view other than physical. A tailored psychological intervention may strengthen the adherence to medical treatments, promote healthy habits, as well as reinforcing the active involvement of caregivers in the care process, thus resulting in better health outcomes. The positive consequences are remarkable under different perspectives, on one hand, the economic costs of the national health system are then reduced, and on the other hand, the individual psychophysical health of subjects aged over 75 has improved.

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