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HEALTH PSYCHOLOGY | RESEARCH ARTICLE

The evaluation of anxiety, depression and Type D personality in a sample of cardiac patients

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Abstract: Many psychological factors influence the onset and prognosis of heart disease, among the most studied, there are personality traits, depressive and anxious experiences. Type D personality, characterized by high levels of social inhibition and negative affectivity, is associated with unfavourable prognosis for cardiac patients. Depressive and anxious symptoms influence the onset of cardiac disorders, the management of the disease and their impact on quality of life. Aim of this study is to evaluate the impact of cardiac rehabilitation on social inhibition, negative affectivity, anxious and depressive symptoms in cardiac patients. Patients were recruited at the Rehabilitation Cardiology Unit of Cittadella Hospital, after an acute cardiac event, they were enrolled to attend a cardiac rehabilitation program. Patients were administered the Hospital Anxiety and Depression Scale (HADS), and the Type D Scale (DS-14). Results showed significant differences between the pre- and post-test evaluation: a decrease in the Negative Affectivity subscale (DS-14) and in the Anxiety subscale and emotional distress (HADS). Other differences

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F. Caccamo is a psychologist and psychotherapist. PhD, research fellow at the University of Padua. Her research areas include evaluation of outcome and process of group psychotherapy, quality of life in cardiac patients, evaluation of palliative care team.

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PUBLIC INTEREST STATEMENT

Having heart disease is a widespread fact among people. Personality characteristics, such as being a shy or pessimistic person or feeling anxious or depressed, are aspects that influence the onset and treatment of heart disease. The purpose of this research is to understand how these personality traits affect heart disease, and especially the study wants to evaluate if any changes in these personality traits can be observed following a cardiology rehabilitation program.

resulted with respect to the sociodemographic variables, particularly unmarried patients showed higher levels of anxiety at the post-test with respect to married patients, also working patients showed lower levels of depression than those who were unemployed or retired because having a job helps patients to feel less depressed because they can concentrate their resources and thoughts on other things that are not just the disease. The study demonstrated that Cardiac Rehabilitation has beneficial effects on the psychological state of patients to stimulate awareness of the disease, modification of its perception and exchange of information valuable to reorganize private and professional lives.

Subjects: Health Conditions; Public Health Policy and Practice; Specialist Community Public Health Nursing

Keywords: cardiac rehabilitation; negative affectivity; depression; anxiety; effectiveness

1. Introduction

Cardiac diseases remain one of the leading causes of death and disability worldwide (WHO, 2011) and their high prevalence in society has been attributed to major changes in work and eating habits as well as income, educational and physical activity levels (Neylon et al., 2013). Many psychological factors influence the onset and prognosis of cardiac diseases, among the most studied are personality traits (e.g., Type D personality) and depressive/anxious symptoms (Albus, 2010; Cohen et al., 2010; Ladwig et al., 2014).

Recent studies have revealed that Type D personality is related to outcomes of cardiac diseases (Grande et al., 2012; Martens et al., 2010). It has been observed that patients with personality D tend to experience high levels of anxiety, irritation, and depressed mood prolonged over time without to show these emotions in social interactions due to fear of incurring in the disapproval of others (Denollet, 2000; Shanmugasegaram et al., 2014; Sogaro et al., 2010).

Type D personality is characterized by high levels of social inhibition and negative affectivity that are related with significantly higher levels of psychological sickness associated with depressive and anxious symptoms (Kupper et al., 2013; Schiffer et al., 2008). Furthermore, it has been observed that Type D personality correlated with unfavorable prognosis for patients who have had a myocardial infarction and a higher risk of unfavorable prognosis (Denollet et al., 2013, 2010; Valtorta et al., 2016).

Among cardiac patients there is a high incidence of depressive or anxious disorders, especially the generalized anxiety disorder is the one most associated with cardiovascular diseases (Tully & Cosh, 2013; Tully et al., 2015). It is known that depressive and anxious symptoms influence not only the onset of cardiac events but also the adherence to treatments, the management of the disease and their impact on quality of life (Fassino & Panero, 2012; Majani, 2012).

It has been found that depression is a factor that predicts reduced adherence to post-infarct therapeutic treatments, in addition it increases by a third the risk of new cardiac events (Abrignani et al., 2014; Huffman et al., 2010). Anxiety appears to be linked to adverse cardiac outcomes; specifically, apprehension is as an independent risk factor which increases the probability of developing an adverse cardiac event (Shen et al., 2008).

Since anxiety and depression are considered modifiable risk factors (Glozier et al., 2013; Neylon et al., 2013) that could facilitate the appearance or even accelerate the aggravation of cardiac disease,

it becomes essential for patients to undertake a Cardiac Rehabilitation program (CR) that combines physical activity with risk factors' modification improve physical exercise capacity, reduce disability and improve re-employment (WHO, 1993). Cardiac Rehabilitation has proved to be an effective treatment that leads to substantial improvements and positive outcomes because it has a significant impact on depression and anxiety of patients through the presence of activities that focus on modifying their personal beliefs and perception of illness, promoting information exchange and sharing fears and concerns about their own daily life (Caccamo et al., 2018; Klempfner et al., 2015).

Cardiac rehabilitation (CR) improves outcomes; however, little is known about the effects of CR on Type D patients (Pelle et al., 2008). A recent study focused on Type D within the cardiac rehabilitation setting showed that Type D patients benefit from cardiac rehabilitation in terms of improved health status and a reduction in depression and anxiety (Karlsson et al., 2007).

Considering the limited number of studies carried out to verify the effects of cardiac rehabilitation on personality, the innovation of this study is to evaluate the impact of a Cardiac Rehabilitation program on social inhibition and negative affectivity (Type D personality) and its effectiveness in reducing depressive and anxious symptoms in patients with cardiac diseases.

2. Method

2.1. Procedure section

The study received the approval of Padua University's Psychological Ethical Committee (Number 2000/2016), and the questionnaires administration was done from October 2016 to July 2017. Patients were recruited at the operating unit of Cardiology, in the Hospital of Cittadella (Italy).

The protocol was proposed to all patients referred for an outpatient CR program after an acute event (ischemic heart disease with or without subsequent myocardial revascularization, chronic heart failure, chronic occlusive peripheral arterial disease, heart transplantation), who attended a 2-week intensive rehabilitation program. Patients with an extended program, reserved for the most compromised patients (mainly those with chronic heart failure and patients unable to participate due to family, work or logistic issues) were excluded. The exclusion criteria included the inability to read or understand Italian, visual or auditory impairments, incomplete data collection, life-threatening conditions and the presence of a neurological deficit. Each patient signed an informed consent, checked and approved by the Ethics Committee of University of Padua.

2.2. Participants

All the patients voluntarily accepted to participate in the study. Among the 76 patients enrolled, five patients dropped out from the rehabilitation program for personal reasons and four patients were excluded from the analysis because they did not complete the post-test evaluation. Therefore, a total of 67 patients were included in the analysis. Patients were distributed as follows: 20 women (29%) and 47 men (71%), with a mean age of 65.03 (range 43–82, SD = 9.71). With respect to diagnosis, patients were as follows: 42% acute myocardial infarction, 14% stable angina, 14% valvular disease, 22% coronary artery bypass, 8% dilated cardiomyopathy.

2.3. Intervention

Within the Cardiology Unit of the Hospital Presidium of Cittadella of ULSS 6 Euganea (where the present study was conducted), the program consists of a two-week intensive cardiac rehabilitation.

The program is characterized by five structured activities. Each activity was carried out twice a week and lasted an hour and a half. Initially, the patients go through all those cardiological surveys necessary for a better evaluation of their post-acute condition. Secondly, they are led to

a period of personal physical training. This is because recent studies have found that the introduction of physical activity in a CR program reduces depressive symptoms, cardiovascular mortality and hospitalization rate, resulting in an overall improvement in quality of life (Herring et al., 2012; Penedo & Dahn, 2005).

The third activity is health education, with the aim to increase resources and self-management skills of patients and to change their personal beliefs which are often erroneous. This also improves compliance and prevents relapses and hospitalizations, raises awareness of the problem and encourages continuous monitoring, even in asymptomatic patients. In addition to that, group meetings with a dietitian are also provided to initiate healthy eating programs mainly based on the Mediterranean diet. Finally, a group of psychological support is provided because any cardiac event involves a high psychological stress that if prolonged, in addition to worsen the quality of life, may cause an increased risk of cardiovascular events. The group, led by a psychodynamic psychotherapist, is a homogeneous open group of about eight patients per session that meets twice a week. The psychotherapist has a specific training on group psychotherapy and on the management of groups of patients with physical diseases, in addition to the therapist, there are also a nurse and a trainee psychologist. The psychological support group offers patients a space dedicated to reflection on their own disease, allowing them to share their deepest anxieties and to understand how to live with the disease (Caccamo et al., 2018). Furthermore, during group meetings by encountering people who lived similar experiences patients increase their perception of social support and the reassurance that comes from it (Fini et al., 2017; Yalom & Leszcz, 2009). There are also individual psychotherapeutic talks aimed to the patients who require further investigation, or the patients reported by the nurses (Mohd-Nor & Bit-Lian, 2019).

2.4. Measures

Patients were administered the Hospital Anxiety and Depression Scale (HADS, Italian validation by Costantini et al., 1999), and the Type D Scale-14 (DS-14; Italian Validation by Gremigni & Sommaruga, 2005).

The Hospital Anxiety and Depression Scale (HADS) is a widely used self-rating scale for the assessment of anxiety and depressive mood. Originally it was developed to screen for anxiety and depression in physically ill patients, the HADS has been used extensively with cardiac and other medical patient populations (Zigmond & Snaith, 1983). The HADS is a 14-item self-report measure, with 7 items referred to an anxiety subscale (e.g., "I feel tense or wound up") and 7 items to a depressive symptom subscale (e.g., "I have lost interest in my appearance"). Items are answered on a 4-point Likert-type scale running from 0 to 3, and total score ranges run from 0 to 21 for both subscales, with higher scores indicating more severe anxiety and depression symptoms. Cut-off points of ≥10 for the anxiety and for the depression subscale were used to select patients at increased risk for clinically relevant anxiety and depression, and the total score (range 0–42, cut-off ≥ 21) is a valid measure of emotional distress as suggested by an Italian validation (Costantini et al., 1999). In the current study, Cronbach's coefficients alpha of the HADS-Anxiety subscale was 0.783 and 0.860 for HADS-Depression subscale, suggesting adequate internal consistency.

The Type-D Scale 14 is the standard instrument for measuring Type-D personality and its components: Negative Affectivity and Social inhibition. It consists of 14 items divided into two scales, one for negative affectivity (NA) (e.g., "I often feel unhappy") and another one for social inhibition (SI) (e.g., "I prefer to keep others at a distance"). Every scale consists of 7 items evaluated on a 5-points Likert scale with a score from 0 to 4, and total score ranges run from 0 to 28 for both subscales. Scores equal or greater than 10 on both DS-14 subscales indicate Type D personality. DS-14 is indicated as a screening test in the evaluation of the cardiac patient and/or as a predictor of future cardiac events (Gremigni & Sommaruga, 2005). Reliability of the scale is acceptable with Cronbach's alpha of 0.825 for Negative Affectivity subscale and 0.809 for Social Inhibition subscale.

Questionnaires were administered by two psychologists at the beginning of rehabilitation (T0: pre-test) and at the end, after two weeks (T1: post-test).

3. Statistical analysis

The statistical package SPSS 22.0 was used for statistical analyses. Tests for paired samples were performed to find differences in anxiety and depression levels and in Negative Affectivity and Social inhibition between pre- and post-evaluation. ANOVA one-way and t-tests for independent samples were performed to explore differences with respect to the sociodemographic variables investigated (age, gender, occupational status, marital status). A P-value of 0.05 or less was considered to indicate statistical significance.

4. Results

Of the 67 patients examined, at the pre-test, 12 scored ≥10 indicating Type D Personality, at the post-test this number decreased to only 8 patients.

About HADS, 6 patients in the pre-test obtained a score ≥21 indicating the presence of a clinically relevant emotional distress, whereas other patients scores showed mostly depressive and anxious experiences. At the post-test, a clinically relevant emotional distress was detected in 10 patients.

Results of the paired t-tests showed significant differences between the pre- and post-test scores: a decrease in the Negative Affectivity subscale (DS-14) (Table 1), and an increase in the HADS-Anxiety subscale and in total score of HADS (Emotional distress) (Table 2).

One-way ANOVA was used for studying the effect of marital status of patients on the dependent variables. Patients were divided according to marital status into three groups (unmarried, married/cohabiting, divorced/widowed). There is a significant difference between the means of those groups ($F = 4.669$, $df = 66$, $p = 0.013$) in the Social Inhibition subscale at the pre-test, and in the HADS-Anxiety subscale at the post-test ($F = 3.472$, $df = 66$, $p = 0.037$). Particularly, patients of unmarried group have higher means in the social inhibition (pre-test) and in the anxiety (post-test) compared to the other two groups (married/cohabiting, divorced/widowed) (Table 3).

Finally, from t-tests for independent samples resulted significantly differences in means depression ($t = 1.738$, $df = 66$, $p = .045$), at the end of the rehabilitation process, for working patients compared to unemployed/retired patients (Table 4). Working patients ($M = 4.56$, $SD = 1.95$) felt less depressed than those who were unemployed or retired ($M = 5.84$, $SD = 2.64$).

No significant differences were found for gender and age variables.

5. Discussion

As emerged from the statistical analysis, there was a statistically significant difference between the beginning and the end of the Cardiac Rehabilitation program. Results showed that at the end of the CR, patients significantly reduced their levels of negative affectivity that is related to depressive experiences (e.g., “I have a dark vision of things”, “I often feel unhappy”). This means that the CR program has a significant impact on the levels of depression of patients because CR activities focus on modifying their personal beliefs and perception of illness, promoting information exchange and sharing fears and concerns about their own daily life (Caccamo et al., 2018; Lockhart et al., 2014; Yohannes et al., 2010).

Results showed a statistically significant increase in the levels of anxiety and emotional distress perceived by patients after CR, this is different from what appears in the literature, i.e. a decrease in anxiety scores after CR program (McMahon et al., 2017; Rutledge et al., 2013; Sandesara et al., 2015).

Table 1. Means, standard deviations and significance of the DS14 before (T0) and after (T1) participation in the cardiac rehabilitation program

DS-14	Administration	Mean	SD	df	t	p
Negative Affectivity	T0	8,65	6,1139	66	2.210	.031
	T1	7,16	5,8817			
Social Inhibition	T0	7,59	6,5714	66	−.737	.464
	T1	7,92	6,4133			

*P < 0.05, **P < 0.01

Table 2. Means, standard deviations and significance of the HADS before (T0) and after (T1) participation in the cardiac rehabilitation program

HADS	Administration	Mean	SD	df	t	p
Depression	T0	5,62	2,4914	66	.846	,401.
	T1	5,40	2,4867			
Anxiety	T0	14,65	3,1069	66	−2,780	.007
	T1	15.59	2,1253			
Total	T0	20,28	2,8699	66	−1,914	.050
	T1	21,00	2,7907			

*P < 0.05, **P < 0.01

Table 3. Univariate ANOVA results to observe the effect of socio-demographic variables on the HADS and DS14 categories (only significant values were reported)

	Marital Status	N	Mean	SD	df	F	p	Post-hoc
Social Inhibition T0	Unmarried	6	14,83	7,8846	66	4.669	.013	1vs2 1vs3
	Married/ cohabitant	48	7,16	6,0647				
	Widow/Divorced	13	5,84	6,108				
Anxiety T1	Unmarried	6	17,66	1,633	66	3.472	.037	1vs2 1vs3
	Married/ Cohabitant	48	15,45	1,9347				
	Widowed/ Divorced	13	15,15	2,577				

*P < 0.05, **P < 0.01

Table 4. Differences of the occupation variable in the scale depression of the HADS to the T1

	Employment	N	Mean	SD	p
Depression T1	Yes	23	4,56	1,9500	.045
	No	44	5,84	2,6409	

We hypothesized that the increase in anxiety and emotional distress may be due to the increased awareness that cardiac rehabilitation aims to stimulate in patients (Gilbody et al., 2008; Giobergia et al., 2010; Lavie & Milani, 2006). During educational meetings on taking medication, stress tests and physical training sessions, patients realize that they need a radical change in their lifestyle (especially about the eating habits to be maintained), and often many of them verbalize their concern about this change. The psychological support group brings each patient to greater awareness thanks to sharing their problems and difficulties with other patients and listening to concerns like their own. This can lead to an increase in anxiety and emotional distress, because they become aware of the need for a radical change in lifestyle to avoid a new heart attack. Therefore, an increase in this dimension can also be seen as a sign of increased patient awareness, which is one of the main objectives of cardiac rehabilitation.

No significant change emerged at the end of the CR program concerning the Social Inhibition subscale. This result was expected and agrees with what is found in the literature (Molinari et al., 2006) because this dimension is difficult to modify in a short-term rehabilitation path contrary from what was expected and emerged for the Negative Affectivity (Lockhart et al., 2014; Yohannes et al., 2010).

Furthermore, unmarried patients differed from married/cohabiting and divorced/widowed because unmarried patients showed higher levels of anxiety at the post-test, confirming what was found in the literature, i.e. unmarried people experience more symptoms of anxiety and depression compared to married people, because they are afraid of being alone in case of a new heart attack (Eng et al., 2011; De Fazio et al., 2012). In addition, it turned out that unmarried people have higher levels of social inhibition at pre-test because of the difficulty of establishing interpersonal relationships.

Finally, working patients showed lower levels of depression than those who were unemployed or retired; having a job helps patients to feel less depressed because they can concentrate their resources and thoughts on other things that are not just the disease (Kim & von Dem Knesebeck, 2016; McGee & Thompson, 2015).

Overall, this study calls attention to the positive impact of CR in the reduction of levels of negative affectivity, and draws attention to the role of some important variables such as the employment and the marital status that can be considered protective factors of the post-disease course.

6. Conclusions

In agreement with other recent studies, our research shows that a short Cardiac Rehabilitation program, is effective in helping patients to better understand the mechanisms underlying their illness and the possibilities of living with it (Pourafkari et al., 2016; Rutledge et al., 2013).

This study encourages specialists of rehabilitation to actively collaborate to help cardiac patients face the situation in which they are involved. Moreover, it can provide useful information to both clinicians and researchers. Heart disease is severe and dangerous; therefore, a preventive rehabilitation program is fundamental. The evaluation described above has the purpose of changing the

perception and the management of the illness and, with regards to cardiac rehabilitation, it allows investigating the typical characteristics of cardiac patients. These characteristics make the path to recovery a more complicated one but nevertheless aimed to wellness. All elements considered, new incentives are given to medical assistants involved in the rehabilitation program to offer improved therapeutic programs which take more variables into consideration, to personalize these programs.

Dedicating time to the perception and management of the illness helps the patient to find a functional and valuable instrument to live with her/his own disease, not only by surviving it but also by enjoying every-day life thanks to the implementation of new functional strategies.

Although the results of this study emphasize the central role of Cardiac Rehabilitation in improving the overall quality of life of cardiac patients, this study has some limitations that should be noted. First, the absence of a follow-up at 1 year, as suggested by other studies (Kavanagh et al., 2002) does not support the conclusion that the reduction of results will be maintained over time. Secondly, the absence of a control group of cardiac patients who have not participated in cardiac rehabilitation, does not consent to generalize the results found the absence of a control or a comparison group does not allow generalizations of the results, as it is not possible to exclude that changes are uniquely due to the passing of time. Thirdly, there were no collections of physical performance objective measures to evaluate possible correlations with psychological symptoms. Lastly, another limit is given by the recruitment of patients. The patients involved in this program were those who willingly decided to get involved in the rehabilitation program without persuasion, thus intending to reach specific goals. It would be of greater interest to succeed in examining the differences between motivated patients and those who did not prove to be truly interested in joining the program and the study, so as to focus the attention on the motivations that persuade the cardiac patient to take part or not in the rehabilitation program. There are very few patients who refuse the rehabilitative path that is recommended to all. The exclusions are mainly related to: distance from home, transport difficulties especially for older non-autonomous patients and young patients who should resume work immediately. Therefore, the absence of a checking sample of absolute necessity that could be used to compare participants with those who were not is clearly a limit, for it does not permit to standardize the results.

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References

Abrignani, M., Renda, N., Abrignani, V., Raffa, A., Novo, S., & Lo Baido, R. (2014). Panic disorder, anxiety, and cardiovascular diseases. *Clinical Neuropsychiatry*, *11*(5), 130–144.

Albus, C. (2010). Psychological and social factors in coronary heart disease. *Annals of Medicine*, *42*(7), 487–494. doi: 10.3109/07853890.2010.515605

Caccamo, F., Saltini, S., Carella, E., Carlon, R., Marogna, C., & Sava, V. (2018). The measure of effectiveness of a short-term 2-week intensive Cardiac Rehabilitation program in decreasing levels of anxiety and depression. *Monaldi Archives for Chest Disease*, *88*(1), 1–4. https://doi.org/10.4081/monaldi.2018.858

Caccamo, F., Saltini, S., Marogna, C., Sava, V., Carlon, R., & Vignaga, F. (2018). The positive impact of a four-week Cardiac Rehabilitation program on depression levels of cardiological patients. *Cor Et Vasa*, *60*(6), e582–e588. https://doi.org/10.1016/j.crvasa.2017.12.003

Cohen, B. E., Panguluri, P., Na, B., & Whooley, M. A. (2010). Psychological risk factors and the metabolic syndrome in patients with coronary heart disease: Findings from the Heart and Soul Study. *Psychiatry Research*, *175*(1), 133–137. https://doi.org/10.1016/j.psychres.2009.02.004

Costantini, M., Musso, M., Viterbori, P., Bonci, F., Del Mastro, L., Garrone, O., Venturini, M., & Morasso, G. (1999). Detecting psychological distress in cancer

patients: Validity of the Italian version of the Hospital Anxiety and Depression Scale. *Supportive Care in Cancer*, *7*(3), 121–127. https://doi.org/10.1007/s005200050241

De Fazio, P., Caroleo, M., Rizza, P., Cerminara, G., De Serio, D., Indolfi, C., & Segura-García, C. (2012). Specific personality traits and coping styles predict affective symptoms in early post acute coronary syndrome inpatients. *The International Journal of Psychiatry in Medicine*, *44*(2), 119–132. https://doi.org/10.2190/PM.44.2.c

Denollet, J. (2000). Type D personality: A potential risk factor refined. *Journal of Psychosomatic Research*, *49*(4), 255–266. https://doi.org/10.1016/S0022-3999(00)00177-X

Denollet, J., Pedersen, S. S., Vrints, C. J., & Conraads, V. M. (2013). Predictive value of social inhibition and negative affectivity for cardiovascular events and mortality in patients with coronary artery disease: The type D personality construct. *Psychosomatic Medicine*, *75*(9), 873–881. https://doi.org/10.1097/PSY.0000000000000001

Denollet, J., Schiffer, A. A., & Spek, V. (2010). A general propensity to psychological distress affects cardiovascular outcomes: Evidence from research on the type D (distressed) personality profile. *Circulation: Cardiovascular Quality and Outcomes*, *3*(5), 546–557. DOI:10.1161/CIRCOUTCOMES.109.934406

Eng, H. S., Yean, L. C., Das, S., Letchmi, S., Yee, K. S., Bakar, R. A., … Choy, C. Y. (2011). Anxiety and depression in patients with coronary heart disease: A study in a tertiary hospital. *Iranian Journal of Medical Sciences*, *36*(3), 201. PMCID: PMC3556768

Fassino, S., & Panero, M. (2012). Dal linguaggio degli organi di Adler alla nuova medicina di per sé psicosomatica. *Rivista di Psicologia Individuale*, *71*, 5–34.

Fini, H. M., Heydari, H., & Al Yassin, S. A. (2017). The Effectiveness of Group Therapy on Rescuing Patients with Cancer. *Emerging Science Journal*, *1*(2), 75–81.

Gilbody, S., Sheldon, T., & House, A. (2008). Screening and case-finding instruments for depression: A meta-analysis. *Canadian Medical Association Journal*, *178*(8), 997–1003. https://doi.org/10.1503/cmaj.070281

Giobergia, E., Mento, C., Pasero, E., Chizzolini, G., Vallauri, P., De Blasi, M., … Feola, M. (2010). Efficacia del lavoro di gruppo nella informazione sanitaria e prevenzione secondaria in pazienti afferenti alla riabilitazione cardiologica. *Monaldi Archives for Chest Disease*, *74*(4), 172–180. DOI:10.4081/monaldi.2010.258

Glozier, N., Tofler, G., Colquhoun, D., Bunker, S., Clarke, D., Hare, D., … Branagan, M. (2013, January). The National Heart Foundation of Australia consensus statement on psychosocial risk factors for coronary heart disease. In *Heart, lung and circulation* (Vols. 22, No. Supp. 1, pp. S258–S258). Elsevier.

Grande, G., Romppel, M., & Barth, J. (2012). Association between type D personality and prognosis in patients with cardiovascular diseases: A systematic review and meta-analysis. *Annals of Behavioral Medicine*, *43*(3), 299–310. https://doi.org/10.1007/s12160-011-9339-0

Gremigni, P., & Sommaruga, M. (2005). Personalità di tipo D, un costrutto rilevante in cardiologia. Studio preliminare di validazione del questionario italiano. *Psicoterapia Cognitiva E Comportamentale*, *11*(1), 7–18.

Herring, M. P., Puetz, T. W., O'connor, P. J., & Dishman, R. K. (2012). Effect of exercise training on depressive symptoms among patients with a chronic illness: A systematic review and meta-analysis of randomized controlled trials. *Archives of Internal Medicine*, *172*(2), 101–111. https://doi.org/10.1001/archinternmed.2011.696

Huffman, J. C., Celano, C. M., & Januzzi, J. L. (2010). The relationship between depression, anxiety, and cardiovascular outcomes in patients with acute coronary syndromes. *Neuropsychiatric Disease and Treatment*, *6*(3), 123. https://doi.org/10.2147/NDT.S6880

Karlsson, M. R., Edström-Plüss, C., Held, C., Henriksson, P., Billing, E., & Wallén, N. H. (2007). Effects of expanded cardiac rehabilitation on psychosocial status in coronary artery disease with focus on type D characteristics. *Journal of Behavioral Medicine*, *30*(3), 253–261. https://doi.org/10.1007/s10865-007-9096-5

Kavanagh, T., Mertens, D. J., Hamm, L. F., Beyene, J., Kennedy, J., Corey, P., & Shephard, R. J. (2002). Prediction of long-term prognosis in 12 169 men referred for cardiac rehabilitation. *Circulation*, *106*(6), 666–671. DOI:10.1161/01.cir.0000024413.15949.ed

Kim, T. J., & von Dem Knesebeck, O. (2016). Perceived job insecurity, unemployment and depressive symptoms: A systematic review and meta-analysis of prospective observational studies. *International Archives of Occupational and Environmental Health*, *89*(4), 561–573.

Klempfner, R., Kamerman, T., Schwammenthal, E., Nahshon, A., Hay, I., Goldenberg, I., … Arad, M. (2015). Efficacy of exercise training in symptomatic patients with hypertrophic cardiomyopathy: Results of a structured exercise training program in a cardiac rehabilitation center. *European Journal of Preventive Cardiology*, *22*(1), 13–19. DOI:10.1177/2047487313501277

Kupper, N., Pedersen, S. S., Höfer, S., Saner, H., Oldridge, N., & Denollet, J. (2013). Cross-cultural analysis of Type D (distressed) personality in 6222 patients with ischemic heart disease: A study from the International HeartQoL Project. *International Journal of Cardiology*, *166*(2), 327–333. DOI:10.1016/j.ijcard.2011.10.084

Ladwig, K. H., Lederbogen, F., Albus, C., Angermann, C., Borggrefe, M., Fischer, D., … Kindermann, I. (2014). Position paper on the importance of psychosocial factors in cardiology: Update 2013. *GMS German Medical Science*, *12*(7), 1-24. DOI:10.3205/000194

Lavie, C. J., & Milani, R. V. (2006). Adverse psychological and coronary risk profiles in young patients with coronary artery disease and benefits of formal cardiac rehabilitation. *Archives of Internal Medicine*, *166*(17), 1878–1883. DOI:10.1001/archinte.166.17.1878

Lockhart, E., Foreman, J., Mase, R., & Heisler, M. (2014). Heart failure patients' experiences of a self-management peer support program: A qualitative study. *Heart & Lung*, *43*(4), 292–298. DOI:10.1016/j.hrtlng.2014.04.008

Majani, G. (2012). Psicologia in cardiologia riabilitativa: Dove tutti i nodi vengono al pettine. E tocca sbrogliarli. *Monaldi Archives for Chest Disease*, *78*(2), 57–59. DOI:10.4081/monaldi.2012.123

Marogna, C., Russo, S. E., Caccamo, F., Pinton, A., Sava, V., & Carlon, R. (2018). The perception of the illness and the self-efficacy in the management of emotions in cardiac patients. *Research in Psychotherapy: Psychopathology, Process and Outcome*, *21*(3), 201–208. DOI:10.4081/ripppo.2018.310

Martens, E. J., Mols, F., Burg, M. M., & Denollet, J. (2010). Type D personality predicts clinical events after myocardial infarction, above and beyond disease severity and depression. *The Journal of Clinical*

Psychiatry, *71*(6), 778–783. https://doi.org/10.4088/JCP.08m04765blu

McGee, R. E., & Thompson, N. J. (2015). Peer reviewed: Unemployment and depression among emerging adults in 12 States, behavioral risk factor surveillance system, 2010. *Preventing Chronic Disease*, *12*(12), 1-7. https://doi.org/10.5888/pcd12.140451

McMahon, S. R., Ades, P. A., & Thompson, P. D. (2017). The role of cardiac rehabilitation in patients with heart disease. *Trends in Cardiovascular Medicine*, *27*(6), 420–425. https://doi.org/10.1016/j.tcm.2017.02.005

Mohd-Nor, N., & Bit-Lian, Y. (2019). Knowledge, attitude and practices of standard precaution among nurses in Middle-East Hospital. *SciMedicine Journal*, *1*(4), 189–198. https://doi.org/10.28991/SciMedJ-2019-0104-4

Molinari, E., Compare, A., & Parati, G. (2006). *Mente e cuore. Clinica psicologica della malattia cardiaca*. Springer.

Neylon, A., Canniffe, C., Anand, S., Kreatsoulas, C., Blake, G. J., Sugrue, D., & McGorrian, C. (2013). A global perspective on psychosocial risk factors for cardiovascular disease. *Progress in Cardiovascular Diseases*, *55*(6), 574–581. https://doi.org/10.1016/j.pcad.2013.03.009

Pelle, A. J., Erdman, R. A., van Domburg, R. T., Spiering, M., Kazemier, M., & Pedersen, S. S. (2008). Type D patients report poorer health status prior to and after cardiac rehabilitation compared to non-type D patients. *Annals of Behavioral Medicine*, *36*(2), 167–175. DOI:10.1007/s12160-008-9057-4

Penedo, F. J., & Dahn, J. R. (2005). Exercise and well-being: a review of mental and physical health benefits associated with physical activity: A review of mental and physical health benefits associated with physical activity. Current Opinion in Psychiatry, 18, 189–193. doi:10.1097/00001504-200503000-00013 2

Pourafkari, L., Ghaffari, S., Tajlil, A., Shahamfar, J., Hedayati, S., & Nader, N. D. (2016). The impact of cardiac rehabilitation program on anxiety and depression levels after coronary artery bypass graft surgery. *Cor Et Vasa*, *58*(4), e384–e390. https://doi.org/10.1016/j.crvasa.2016.01.001

Rutledge, T., Redwine, L. S., Linke, S. E., & Mills, P. J. (2013). A meta-analysis of mental health treatments and cardiac rehabilitation for improving clinical outcomes and depression among patients with coronary heart disease. *Psychosomatic Medicine*, *75*(4), 335–349. https://doi.org/10.1097/PSY.0b013e318291d798

Sandesara, P. B., Lambert, C. T., Gordon, N. F., Fletcher, G. F., Franklin, B. A., Wenger, N. K., & Sperling, L. (2015). Cardiac rehabilitation and risk reduction: Time to "rebrand and reinvigorate". *Journal of the American College of Cardiology*, *65*(4), 389–395. https://doi.org/10.1016/j.jacc.2014.10.059

Schiffer, A. A., Denollet, J., Pedersen, S. S., Broers, H., & Widdershoven, J. W. (2008). Health status in patients treated with cardiac resynchronization therapy: Modulating effects of personality. *Pacing and Clinical Electrophysiology*, *31*(1), 28–37. doi: 10.1111/j.1540-8159.2007.00922.x

Shanmugasegaram, S., Flett, G. L., Madan, M., Oh, P., Marzolini, S., Reitav, J., Hewitt, P. L., & Sturman, E. D. (2014). Perfectionism, Type D personality, and illness-related coping styles in cardiac rehabilitation patients. *Journal of Health Psychology*, *19*(3), 417–426. https://doi.org/10.1177/1359105312471571

Shen, B. J., Avivi, Y. E., Todaro, J. F., Spiro, A., Laurenceau, J. P., Ward, K. D., & Niaura, R. (2008). Anxiety characteristics independently and prospectively predict myocardial infarction in men: The unique contribution of anxiety among psychologic factors. *Journal of the American College of Cardiology*, *51*(2), 113–119. https://doi.org/10.1016/j.jacc.2007.09.033

Sogaro, E., Schininà, F., Burgisser, C., Orso, F., Pallante, R., Aloi, T., Vanni, D., Pazzagli, A., & Fattirolli, F. (2010). Type D personality impairs quality of life, coping and short-term psychological outcome in patients attending an outpatient intensive program of cardiac rehabilitation. *Monaldi Archives for Chest Disease*, *74*(4), 181–191. https://doi.org/10.4081/monaldi.2010.259

Tully, P. J., & Cosh, S. M. (2013). Generalized anxiety disorder prevalence and comorbidity with depression in coronary heart disease: A meta-analysis. *Journal of Health Psychology*, *18*(12), 1601–1616. https://doi.org/10.1177/1359105312467390

Tully, P. J., Winefield, H. R., Baker, R. A., Denollet, J., Pedersen, S. S., Wittert, G. A., & Turnbull, D. A. (2015). Depression, anxiety and major adverse cardiovascular and cerebrovascular events in patients following coronary artery bypass graft surgery: A five-year longitudinal cohort study. *BioPsychoSocial Medicine*, *9*(1), 14–24. https://doi.org/10.1186/s13030-015-0041-5

Valtorta, N. K., Kanaan, M., Gilbody, S., Ronzi, S., & Hanratty, B. (2016). Loneliness and social isolation as risk factors for coronary heart disease and stroke: Systematic review and meta-analysis of longitudinal observational studies. *Heart*, *102*(13), 1009–1016. https://doi.org/10.1136/heartjnl-2015-308790

WHO (1993). Rehabilitation After Cardiovascular Diseases, with Special Emphasis on Developing Countries: Report of a WHO Expert Committee. Meeting Held in Geneva from 21 to 18 October 1991.

WHO. (2011). *Global atlas on cardiovascular disease prevention and control*. http://www.who.int/cardiovascular_diseases/publications/atlas_cvd/en/

Yalom, I. D., & Leszcz, M. (2009). *Teoria e pratica della psicoterapia di Gruppo*. Bollati Boringhieri.

Yohannes, A. M., Doherty, P., Bundy, C., & Yalfani, A. (2010). The long-term benefits of cardiac rehabilitation on depression, anxiety, physical activity and quality of life. *Journal of Clinical Nursing*, *19*(19-20), 2806–2813. https://doi.org/10.1111/j.1365-2702.2010.03313.x

Zigmond, A. S., & Snaith, R. P. (1983). The hospital anxiety and depression scale. *Acta psychiatrica scandinavica*, *67*(6), 361–370. https://doi.org/10.1111/j.1600-0447.1983.tb09716.x

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