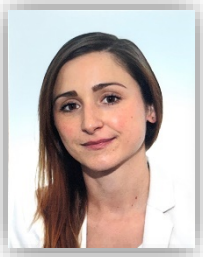
https://doi.org/10.52982/lkj178

NEED-ADAPTED AND INDIVIDUALIZED PSYCHOCARDIOLOGICAL INTERVENTION IN PATIENTS WITH MYOCARDIAL INFARCTION TO REDUCE CONSEQUENTIAL PSYCHOLOGICAL DISEASES



Maria Fadljevic
Cand. Med.
Anesthesiology resident at Varisano Hospital Main-Taunus (Bad Soden, Germany)
Email: mariafadljevic@gmail.com

Claudia Christ
Prof. Dr., MD, internal medicine, Master of Public Health
CEO, Master Trainer of PPT and psychotherapist at Akademie an den Quellen (Wiesbaden, Germany)
Email: christ@akademie-quellen.de
ORCID: 0000-0002-6699-0428

Joachim R. Ehrlich
Prof.Dr.med.Dr.med.habil
Head of Cardiology at St.-Josefs-Hospital (Wiesbaden, Germany)
Department chair at Johann-Wolfgang Goethe University (Frankfurt am Main, Germany)
Email: christ@akademie-quellen.de
ORCID: 0000-0002-5803-9843

Selina Raisch
Master of Psychology
Head of research at Akademie an den Quellen (Wiesbaden, Germany)
Head of research at Institut für modernes Personalmanagement (Wiesbaden, Germany)
Email: selina.raisch@live.de

Emilia Herlitzius
Cand. Bachelor of Psychology
Head of diagnostics at Akademie an den Quellen (Wiesbaden, Germany)
Email: e.herlitzius@web.de

Received 15.11.2022
Accepted for publication 30.12.2022
Published 20.01.2023

Abstract

A heart attack is often a very drastic, sometimes even traumatic, life event for patients, which is frequently associated with fear of death. Not only is the body under enormous stress, a heart attack also means stress for the psyche. "Stressful life events are part of human existence and are compensated for with individual coping strategies or defense mechanisms. However, if the strain is overwhelming or the possible solutions are subjectively exhausted, pathological reactions may occur."(1) From a psychosomatic perspective, an acute myocardial infarction is a "significant biographical breaking point with far-reaching psychological consequences."(2) This pilot study investigates whether a psychocardiological intervention integrated into standard therapeutic care in the form of a structured conversation with a biopsychosocial model (in the sense of the WHO understanding of health), adapted to the patient's level of need, can have a positive effect on quality of life and on psychological comorbidity in the short- and long-term course of recovery. 45 patients with acute myocardial infarction (13 female, 32 male), who were randomly assigned to two intervention groups, were followed for six months after the cardiac event with individualized and collaborative psychocardiological interventions and tested for mental illness. The results of the study show that such individualized care with additional screening for psychological comorbidities in the early phase after a myocardial infarction can significantly help patients to help themselves, provide early indications of the presence of a psychological disorder, and accelerate the initiation of adequate treatment. The integration of a psychocardiological component into the standard therapy of myocardial infarction patients in the early phase after the cardiac event seems to be a valuable contribution to the therapy and should receive encouragement in the future. Furthermore, this pilot study offers new and interesting approaches for future research.

Keywords: psychocardiology, myocardial infarction, depression, anxiety, Balance model, psychological comorbidity after myocardial infarction, positive psychotherapy

Introduction

Patients often experience an acute myocardial Patients often experience an acute myocardial infarction (MI) as a drastic and life-threatening event that can trigger fears and place enormous requirements for change on their daily lives. Uexküll (2002) already coined the term "adjustment disorder" to explain the development of illness: "When there is something new, people have to adapt. Sometimes it is successful, sometimes not. And because the environment changes faster and faster, more and more adaptations have to be made on all levels." The more drastic the event, the more resilience we need in order to be able to adapt adequately.

After experiencing cardiopulmonary resuscitation, cardiac catheterization, or cardiac bypass surgery, patients may develop post-traumatic stress disorder (PTSD). Psychological processing of the event varies and depends on numerous variables. Some patients survive the event without lasting mental illness. However, nearly 50% of cardiac patients develop an adaptation disorder (lasting approximately 12-18 months), 13% suffer from PTSD, and one in five patients develops depression, which is associated with increased overall mortality. Nevertheless, only about 25% of those with mental illness are successfully identified in "routine care" (Amin et al., 2006; Hermann-Lingen, 2019; Melle et al., 2004). This leads to corresponding adverse short- and long-term consequences in terms of quality of survival, compliance, and prognosis of patients. In addition, the biopsychosocial integration and life satisfaction are also affected by the cardiac disease (Badura, 1987).

About 40 years ago, research began to put more focus on psychosocial factors of cardiac diseases in the course of the disease and treatment.

According to results of survey studies (Badura, 1987) and case studies (Speedling, 1982; Sprenger et al., 1988), it was already proven at that time that medical counselling of MI patients showed enormous deficits, especially in the areas of communication of non-somatic risk factors. Detailed education about the impact of the cardiac event on everyday life, such as physical limitation, job loss, financial losses, etc., played a minor role.

Psychotherapeutic interaction in the hospital in order to improve the prognosis, was considered inevitable even back then (Klapp et al., 1988). Since then, influences of the psyche on the

autonomic nervous system and the cardiovascular system (Hummel 2022) have been shown again and again, but little has been investigated with regard to a possible positive influence of an overall medical-therapeutic supervision.

In addition to the standard therapy with medical-clinical guideline-based interventions, lifelong medication, support in lifestyle optimization and follow-up treatment, patients with psychological treatment needs should be connected to professional outpatient care facilities as early as during the rehabilitation period. In practice, this means finding psychiatrists and psychotherapists nearby, depending on the disorder and local availability.

However, a seamless transition to outpatient psychotherapeutic care correspondent to the patient's needs poses a major problem in most cases and has not been feasible to date (Ladwig & Fritzsche et al., 2013). Average waiting times for an outpatient psychotherapy treatment slot in 2019 (before the COVID-19 pandemic) ranged between three to nine months (Federal Chamber of Psychotherapists, 2019). It should also be considered that psychotherapy is only responsible for clinically manifest diseases, but there are no facilities for "lifestyle counseling" and biopsychosocial "optimization" in the sense of preventive action before clinically manifested anxiety or depression occur. In line with that, Albus and Fritzsche (2018) have already proposed basic psychocardiological care and a basic structure for psychocardiological consultation.

In summary, the abovementioned facts lead to the hypothesis that a psychocardiological intervention integrated into the standard therapy, adapted to the patient's degree of need, could have a positive effect on the quality of life and on psychological comorbidity in the short- and long-term course of therapy. Considering all the facts in the literature and studies summarized above it can be recognized that more than 50% of the patients with myocardial infarction have a psychological comorbidity. For one, this has a negative influence on their continuing quality of life and the course of disease. Furthermore, the risk of a new infarction and the associated mortality is increased (Albus et al., 2018). Considering this it becomes apparent that it is of great relevance to address these psychological issues of the patients. Corresponding calls for further knowledge in this field have been increasing strongly. Yet, to the authors' knowledge, no other studies have been conducted in the way that this study has. Therefore, it seems very important to continue the research and to find all the information and possibilities to help these patients in the best possible way.

1.1 Psychocardiology

"Psychocardiology encompasses the knowledge regarding psychosocial factors in the development, course, rehabilitation of, and recovery from cardiologic diseases." (Jordan, 2001) It thus represents an interdisciplinary interface of the fields of cardiology, psychotherapy, psychology, and many other disciplines (Schubmann et al., 2018).

Since about 1950, numerous studies have been conducted to add the psychological component to the purely physiologically oriented "risk factor model." In this context multiple researchers investigated different behavioral patterns or behavioral types (e.g. hostility, reaction to work load (Siegrist et al., 1998), A-type (Roseman, 1980), D-type(Denollet, 2000)) and their connection to coronary heart disease. Overall, as Jordan (2001) describes, "there is no doubt that coronary heart disease is a multifactorial somato-psychic/psycho-somatic event of great complexity."

Psychosocial variables that are seen to be relevant for the course of coronary heart diseases include affective disorders such as anxiety and depression and the (high) quality of social relationships. The following factors were already identified to be relevant in the context of cardiology in 2001 (Jordan et al.):

1. social class
2. stress, strain, gratification crises
3. vital exhaustion before cardiac event
4. anxiety, depression, negative affect
5. family and social support
6. processing of the coronary disease
7. effectiveness of psychological interventions

These above-mentioned factors can be found in the four pillars of Peseschkian's balance model (1977). This model, which originates from psychotherapy, is used in this pilot study to assess the patients' quality of life and thus includes these aspects identified as fundamental for therapy of heart attack patients (see *Figure 1*).

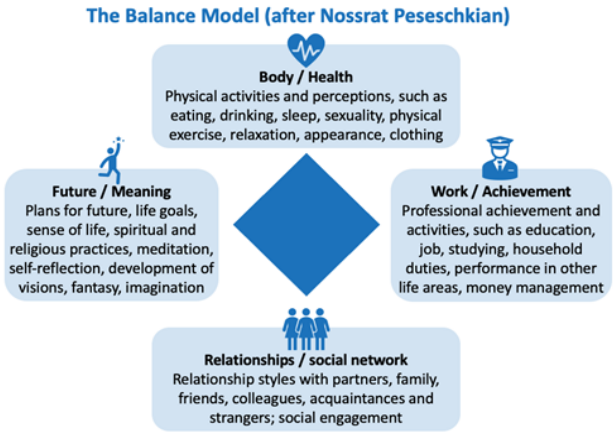


Figure 1. The Balance Model after Nossrat Peseschkian (adapted by Christ & Mitterlehner following Peseschkian & Remmers, 2020; extracted from Christ & Raisch, 2022)

Another position paper on the importance of psychosocial factors in cardiology (Ladwig et al., 2013) could confirm the abovementioned points and shows positive effects regarding the effectiveness of psychosocial interventions in secondary prevention with respect to quality of life, health behavior, somatic risk profile, and cardiovascular comorbidity and mortality. Also, a 2018 update of the position paper lists that short-term psychotherapeutic interventions during the acute postinfarction phase in the hospital have a positive effect on the reduction of depressive and anxiety symptoms (Albus et al., 2018).

In an article in the “Deutsche Ärzteblatt”, Weber (Charite Berlin) and Gundold (Leipzig Heart Center) pronounce a lack of psychocardiological care. "While psycho-oncological approaches have been established long ago, a psychoardiological approach is still generally lacking" (Meissner et al., 2011).

Methodology

2.1 Study design

The study was conducted in a monocentric setting at St.-Josefs- Hospital in Wiesbaden, Germany. It is a prospective, clinical trial in which patients were single-blinded and randomly assigned to an intervention group (IVG) and a mini-intervention group (MIVG) between 2016 and 2019. Simple randomised controlled trials are the gold standard of clinical research(Schulz & Grimes, 2007) to ensure that all potential confounders in the patient groups which are being compared have identical distributions. So randomization is the random allocation of patients. The aim is to exclude unconscious and conscious influences of the treating and documenting investigator on the choice of therapy depending on the individual condition of a study participant. The patients did not know which group they were assigned to at any time during the study. This single blinding should lead to a reduction of bias and thus to results being independent of the patients' expectations (Schulz & Grimes , 2002). A total of 45 patients participated, 34 of whom completed all times of measurement. Thus, a total of 18 patients in the IVG and 16 patients in the MIVG completed the study. Subjects were enrolled in the study three to five days after the cardiac event, still during the acute hospitalization (t0). A brief introductory interview was followed by an explanation of the study design and completion of a demographic survey. A positiv ethical approval for this pilot study was given by the ethics committee under the condition that every patient of both groups receives both an interview and intervention.

2.1.1 Intervention for the IVG

The IVG was called in after two (t1) and four (t2) months for a 45-minute modular intervention each. A modular scheme was conducted due to comparability and independence from the investigator herself. The interview focused on possible psychosocial consequences of the MI and the impact of the event on daily life in the four domains of life according to the Balance model after Peseschkian (2003): Body, Work, Social Network, and Values . The possible development of a concomitant mental illness, such as depression and anxiety, was also assessed. The psychological findings, staging of the interview, and countertransference were recorded.

In addition to the initial interview, the IVG received the guidebook "What's on Your Mind?" by Prof. Nossrat Peseschkian. By pointing out relevant chapters that addressed the individual needs and problem areas of each subject, the intention was to provide a guide for dealing with the psychosocial effect of the MI and to encourage the patient's ownership of it. IVG patients were encouraged to actively design the time between interventions in terms of a health-promoting psychosocial individualized lifestyle. Possibilities included maintaining social contacts, exercise and sport, and stress, anxiety and depression management. In the course of this, they received appropriate exercises at the second intervention appointment (t2). These were tailored to the problem areas of the individual that had been identified in the initial interview and were

intended as an orientation for the next few months.

2.1.2 Intervention for the MIVG

The MIVG received a so-called "mini-intervention" after two (t1) and four (t2) months. This included a short questionnaire on the influence of the cardiac event on everyday life, especially in the four areas of life according to the Balance model: body, work, social network and values. The survey on the four areas was conducted in order to allow a comparability between the two groups. This was done without addressing individual problem areas or working out a psychocardiological background with the patient. The MIVG was not given a guidebook or other assistance in the form of individually tailored exercises. Nor was she explicitly advised of a health-promoting lifestyle and active personal initiative. The focus here was on the different ways of processing the MI between the two groups with and without assistance.

2.1.3 Measurement of dependent variables in both study groups

After a follow-up period of six months (t3), each participant of the IVG and the MIVG was invited to an individual 60-minute final interview.

To assess the possible development of an anxiety disorder or depression after the cardiac event, standardized instruments from psychological test diagnostics were used. These were completed by all subjects during the second session (t1) and during the final session (t3). The results of the first questionnaire evaluation (from t1) were used at the interview appointment (t2) only for the IVG and could thus be incorporated into the intervention and exercise recommendation. No results were discussed within the MIVG at this time (t2).

The goal was to examine changes in quality of life and the occurrence of possible mental illnesses such as anxiety or depression throughout the six-month period using the questionnaire results so that a valid conclusion could be drawn. The comparison of the overall test results were discussed in the final patient session.

2.2 Measures

In the course of the study, a standardized questionnaire was used in both groups to detect the first signs of mental illness two (t1) and six months (t3) after the MI. The main goal was to identify and assess affective psychological disorders such as anxiety and depression. To record the life situation and quality of life, the *Akademie-an-den-Quellen questionnaire* (AQ-questionnaire) was used, which is aimed at surveying the central areas of life according to the balance model after Peseschkian. The measures used in this study are described in more detail below.

2.2.1 Hospital Anxiety and Depression Scale, German version (HADS)

The HADS-D is a screening procedure for identifying anxiety and depression in patients with somatic diseases. Self-assessment is used to determine the severity of anxiety and depressive symptoms. Severe psychopathological symptoms are deliberately excluded, which contributes to the very high acceptance of the questionnaire in target groups (Snaith et al., 2011). The HADS-D and its translations have been extensively validated. The two-factorial structure with one anxiety and one depression factor each has been confirmed in various publications. The two subscales are sufficiently valid and sensitive to change.

2.2.2 Akademie-an-den-Quellen questionnaire (AQ questionnaire)

This is a screening tool that is intended to test the stress factor in various areas of life and the associated quality of life. Partly, it is based on the standardized *Maslach Burnout Inventory* (*MBI*), which is intended to provide a statement about stress at work. Furthermore, other areas of life are queried in the sense of the bio-psycho-social model according to the WHO using questions based on the balance model by Nossrat Peseschkian. The subscales correspond to the four areas of the Balance model: body, work and performance, social network, values and norms. The *AQ questionnaire* was compiled by Christ and Mitterlehner, both lecturers at the *Wiesbaden Academy for Psychotherapy* (*WIAP*), who attempted to construct a questionnaire in collaboration with Pesechkian based on the balance model, thus allowing for standardization.

For the present study, these questions surveying the four life areas of the balance model were used.

2.2.3 Feedback questionnaire

At the end of the study (t3), the subjects had the opportunity to assess to which extent the study had provided them with personal assistance. At this final interview, participants were invited to name all aspects of the study that had been perceived as appealing or helpful. Furthermore, they were asked to assess whether (early) psychocardiological support in the therapy of MI patients was useful and whether they would recommend a similar procedure to be offered to other affected patients.

2.3 Psychocardiological intervention

The psychocardiological interventions took place according to a modular scheme to ensure the greatest possible independence from the person of the investigator. This scheme is intended to allow a need-adapted and individualized approach for the patient, which has already been shown to be very effective in past studies (Angermann et al., 2012).

The balance model according to Nossrat Peseschkian is used as the underlying model for recording the life situation of the individual patient. This model has proven itself for decades in basic psychosomatic care and brief intervention by general practitioners, e.g. in counseling, coaching and psychotherapeutic support. A similar model has been described by Petzold (1993) in his five Pillars of Identity. According to Peseschkian (2015), "According to the balance model, a healthy person is the one who tries to distribute his energy evenly among all four areas." This is also in line with the WHO (Ottawa-Charta, 1986) understanding of health: "Health is not the absence of disease, but the social, emotional, physical and mental well-being while living, playing and working."

For this study, the balance model was used to explain, visualize, and later analyze the individual psychosocial level of the subjects in the four domains: Body/Health, Work/Performance, Social Network, Values/Norms. This made it possible to make statements about the quality of life of the individual at different points in the study and to compare them.

Results

The data collected were stored electronically in pseudonymized form in compliance with privacy regulations. The statistical analysis of the data was conducted using the statistical analysis software IBM SPSS Statistics, Version 27.

3.1 Sample

The sample included a total of 45 patients admitted as inpatients to St. Josefs Hospital Wiesbaden (Germany) with STEMI (ST segment elevation myocardial infarction) or NSTEMI (non-ST segment elevation myocardial infarction) between October 2016 and June 2017. Of these, 29% (13) were female and 71% (32) were male. The age of the patients ranged from 35 to 82 years (m = 61.78, SD = 9.64). Because of missing data at t1 and t2, a total of 11 patients had to be excluded. Thus, 18 subjects in the IVG and 16 subjects in the MIVG could be considered for the statistical analyses. Among these 34 (75.6%) subjects who fully completed the study, 18 (52.9%) patients (6 female, 12 male) belonged to the IVG and to 16 (47.1%) patients (4 female, 12 male) were classified as MIVG. Analysis of the comparability of the two groups in terms of descriptive parameters showed no significant differences the demographic variables such as age, sex, marital status, etc.

3.2 Inferential statistical analysis

At t1, before the beginning of the intervention, both groups showed no notable differences on the HADS-D Anxiety subscale or the AQ questionnaire. However, the two groups differed significantly in their symptom severity in terms of depressiveness ($t(36)=1.80$; $p<.05$). Thus, the IVG showed significantly more severe depressive symptoms than the MIVG before the start of the intervention ($m_{IVG}=4.48$, $_{mMIVG}=2.60$). Statistical analyses revealed that IVG's scores on both scales (AQ questionnaire and HADS-D) did not change significantly from t1 to t3. For the MIVG, on the other hand, there was a significant reduction for both HADS-D subscales (anxiety and depression) from the first time of measurement (t1) to the second (t3; see Table 1). When both intervention groups were analysed together, there were no significant differences across the intervention groups from t1 to t3 on any of the scales examined.

Table 1.
Scores at t1 and t3, t- and p-values for the minimal intervention group on both subscales of HADS-D

Subscale	t1	t3	*t*(15)	*p*
Depression	2.75	1.88	2.05	.029
Anxiety	5.56	3.38	3.69	.001

Statistical comparison of the two intervention groups at t3 revealed that at t3 the IVG had significantly higher scores in the HADS-D depression subscale and marginally significantly higher scores in the anxiety subscale than the MIVG ($t(32)_{anxiety}=1.58$, $p_{anxitey}=.062$ $t(32)_{depression}=2.10$, $p_{depression}<.05$). When analysing the feedback and evaluation questions collected at t3 after the completion of the intervention, it is noticeable that the IVG patients were significantly more likely to report "living more consciously" as a result of study participation and intervention than the MIVG subjects ($t(32)=2.85$, $p<.05$).

Discussion

In summary, the evaluation of the HADS shows that the IVG compared to the MIVG initially shows more depressiveness, and that the groups do not differ with regard to general anxiety initially. At t3, the MIVG continued to show significantly lower scores on the depression scale of the HADS-D than the IVG. In addition, the scores of the MIVG and the IVG on the anxiety scale of the HADS-D at t3 differed marginally significantly in terms of lower scores of the MIVG. The course analysis of the HADS-D scores also revealed that the scores of the MIVG on these two subscales decreased significantly from t1 to t3.

An improvement of symptoms of a depression or anxiety disorder when using a psychotherapeutic treatment depends on many factors - duration of symptoms, genetic disposition, exhaustion, structural level of the patient, the patient's attitude, environment, personality structure - so that no statement can be made about a uniform standardization of the therapy's success. It can be assumed that in some subjects, especially in the IVG, some of the above-mentioned factors played a role and thus had an influence on the results.

Furthermore, when considering the results of IVG, it is important to keep in mind that a psychotherapeutic treatment may well initially result in a worsening of condition, but that this should be viewed as a development within the therapy process (Neurologen und Psychiater im Netz). However, the fact that a sensitization must have taken place through the concrete confrontation with the MI was clearly evident from the results of the AQ questionnaire, especially in the IVG. Overall, the patients presented themselves as "living more consciously" and were thus better able to assess their own situation, but at the same time this meant that they were also more sensitive to grievances and physical symptoms as well as their mental state. This could be used as an explanation for the fact that the patients in the IVG initially showed no improvement in their symptoms on all scales studied, while the participants in the MIVG reported a stabilization of anxiety and depressive symptoms according to the subscales of the HADS-D.

Taking into account the gender distribution of the samples, it is noticeable that male participants predominate. This circumstance could also imply a bias in the results with regard to a truthful response to the questionnaires. According to the subjective perception of the investigator, some of the male participants did not show much concern in the interviews at first. It appeared that the "male role" as the main breadwinner and strong person in society influence their answers to the questionnaires, in a way that items, that "projected weakness", were not always answered truthfully. These impressions are consistent with research by Kessler et al, who found in four large-scale studies, that among men with depressive symptoms, there was a lower rate of treatment due to a mismatch between need for support and seeking it (Kessler et al., 1981). In this context, social gender role is a risk factor in mental health problems and their timely treatment. "It is argued that social norms of traditional masculinity produce barriers to help-seeking via inhibition of expressivity, already influencing symptom perception as the first step in the help-seeking process and controlling responses to symptoms."(Möller-Leimkühler, 2000)

If the drop-outs of the study are included in the overall analysis, it is noticeable that mainly those patients completed the study who showed more conspicuous values in the questionnaires at the beginning and made an overall more strained impression in the interviews. A targeted analysis and working on individual problems were apparently considered useful here, which is also reflected in the statements made in the feedback form. A distortion of the results due to this apparent systematization in the drop-out cannot be completely ruled out.

Due to the small sample size and the associated low statistical power, it can also be assumed that the detection of significant differences was made more difficult. Furthermore, for ethical reasons it

was not justifiable to form a control group that only answered the questionnaires without being supported by personal interviews. The influence of a significant comparison can therefore not be ruled out and it can be assumed that this is reflected in the results of the two groups.

When interpreting the present results, it should be kept in mind that this study is not without limitations. The different baseline values suggest that the IVG was significantly more strained even before the intervention. It is also probable that the observation period was too short, especially for the more severely stressed IVG: while the study took six months in total, there were only four months between the first and the second answering of the questionnaires (t1 to t3). It is possible that a longer processing and treatment process could have helped to detect an improvement due to the intervention. In addition, the small sample size as well as the fact that the study was only single-blinded and conducted by one single investigator could lead to a distortion of the results and therefore poses a limitation of the study. It will be the assignment of future research to replicate the findings using a larger sample and an even more controlled and double-blinded study design.

There are also several aspects that emphasize the quality and relevance of the present study. For example, the chosen study design, a longitudinal study, offered the possibility to draw causal conclusions. Due to the use of well-validated and standardized questionnaires from the fields of psychotherapy and psychology, validity and reliability can be assumed to be high. What's more, the use of the balance model to analyze individual strengths and weaknesses in the four areas of life proved to be very practical and valuable. Furthermore, the analysis of the descriptive variables shows that the two groups are well comparable considering those parameters at the beginning of the study.

As the present study is a field study with high practical relevance within the holistic therapy of MI patients, these results can be seen as further indication of the need for integration of psychocardiological care into the standard MI therapy.

Conclusions

Heart attack patients often suffer from psychological complaints and cognitive dysfunctions. Simultaneous treatment of cardiac and psychological imbalance is important for a good survival prognosis after MI. Screening for psychological comorbidities should be standard in MI patients in the early phase after the cardiac event. In this study, even minimal interventions were able to reduce abnormalities in the area of anxiety and depression. Patients in both groups were grateful for the possibility of conversational sessions. Thus it could be shown that even the possibility of a therapeutic conversation can support the processing and thus contribute to the improvement of the quality of life. To the knowledge of the authors, this study represents the first indicator that such interventions could be useful: they contribute to the promotion of self-help and awareness of mindfulness and should be considered to be incorporated into the standard therapy of heart attack patients. It is incumbent on further research to pursue this and investigate it in larger selected samples and over a longer study period. With the remaining variables or patient characteristics collected, it would be possible to subsequently perform exploratory data analysis to identify correlations and, if necessary, examine them more closely. The findings collected open up further questions and thus new and interesting approaches for further research in the field of psychocardiology.

References

[1] **ALBUS, C., WALLER, C., FRITZSCHE, K. H., et al.** (2018) Bedeutung von psychosozialen Faktoren in der Kardiologie [Importance of psychosocial factors in cardiology] – Update 2018. *Kardiologe* Vol.12,pp. 312–331. [in German]. URL: https://leitlinien.dgk.org/files/2018_Positionspapier_Psychosoziale_Faktoren_Kardiologie.pdf [accessed: 14.11.2022]

[2] **AMIN A., et al.** (2006) The prevalence of unrecognized depression in patients with acute coronary syndrome. *American Heart Journal*, Vol. 152, Issue 5, p. 928-934.

[3] **ANGERMANN, C. E., STÖRK, S., GELBRICH, G., FALLER, H., JAHNS, R., FRANTZ, S., LOEFFLER, M., ERTL, G.** (2012). Competence Network Heart Failure. Mode of action and effects of standardized collaborative disease management on mortality and morbidity in patients with systolic heart failure: the Interdisciplinary Network for Heart Failure (INH) study. *Circ Heart Fail*, 5(1), pp. 25-35. DOI: 10.1161/CIRCHEARTFAILURE.111.962969

[4] **BADURA, B.** (1987) *Krankheitsbewältigung als psychosozialer Prozess.* In: Leben mit dem Herzinfarkt. [Coping with illness as a psychosocial process. In: Living with Heart Attack] Berlin, Heidelberg, Springer [in German].

[5] **BUNDESPSYCHOTHERAPEUTENKAMMER (BPtK)** (Herausgeber) [federal Chamber of Psychotherapists (Publisher)] (2019) Studie zu Wartezeiten in der ambulanten psychotherapeutischen Versorgung.

Umfrage der Landespsychotherapeutenkammern und der BPtK [Study of waiting times in outpatient psychotherapy care. Survey of the state chambers of psychotherapists and federal Chamber of Psychotherapists] URL: https://www.bptk.de/bptk-auswertung-monatelange-wartezeiten-bei-psychotherapeutinnen/?cookie-state-change=1655814248740 [accessed: 14.11.2022]

[6] **CHRIST, C., & RAISCH, S.** (2022). Bouncing back: Resilient Human Factor Management. *The Global Psychotherapist,* Vol. 2(1), pp. 34-40.

[7] **DENOLLET, J.** (2000). Type D personality. A potential risk factor refined. *J Psychosom Res*. Vol. 49(4), pp.255-66.

[8] **FREYBERGER, H. J., SCHNEIDER W., STIEGLITZ, R. (Eds.)** (2002). Kompendium *Psychiatrie, Psychotherapie, Psychosomatische Medizin*, [Compendium of Psychiatry, Psychotherapy, Psychosomatic Medicine], Begründet von Th. Spoerri 11., vollständig erneuerte und erweiterte Auflage, orientiert an der ICD-1, 139 p. [in German]

[9] **HERRMANN-LINGEN, C.,** (2019) Psychokardiologie – aktuelle Leitlinien [Psychocardiology - current guidelines] *Psychother Psych Med,* Vol. 69, pp. 237–252 [in German]

[10] **HUMMEL, E.** (2022) Regulation des autonomen Nervensystems bei depressiven Patienten unter psychosozialem Stress und der Zusammenhang mit dem kardiovaskulären Risiko. [Regulation of the autonomic nervous system in depressed patients under psychosocial stress and the relationship with cardiovascular risk] *Open Access: Repositorium der Universität Ulm und Technischen Hochschule Ulm.* [Repository of the University of Ulm and Ulm University of Technology] DOI: http://dx.doi.org/10.18725/OPARU-43450

[11] **JORDAN, J., BARDE B**. (2005) Posttraumatische Belastungsstörungen nach einem akuten Herzinfarkt [Posttraumatic stress disorder after acute myocardial infarction], *Psychotherapeut,* No. 1, p. 33 -34.

[12] **JORDAN, J., et al.** (2001) Psychokardiologie heute, *Herz* 26, Vol. 5, p. 336.

[13] **JORK, K., PESESCHKIAN, N.** (2003). *Salutogenese und Positive Psychotherapie, Gesund werden – gesund bleiben* [Salutogenesis and Positive Psychotherapy, Getting Healthy - Staying Healthy],Hans Huber, 95 p. [in German].

[14] **KESSLER, R. C., BROWN, R. L., BROMAN, C. L.** (1981). Sex differences in psychiatric help-seeking: evidence from four large-scale surveys, *J Health Soc Behav,* Vol.1, pp.49-64.

[15] **KLAPP, B. F., DAHME, B.** (1988) Jahrbuch der medizinischen Psychologie [Yearbook of Medical Psychology] *Psychosoziale Kardiologie*, Vol. 1, pp. 105-107 [in German].

[16] **LADWIG, K. H., ALBUS, C., FRITZSCHE, K. H., et al.** (2013) Positionspapier Update 2013 [Position Paper Update 2013]. *Kardiologe*, Vol.7, pp.7-27 [in German].

[17] **LADWIG, K. H., F. LEDERBOGEN, F., ALBUS, C., et al.** (2013). Positionspapier zur Bedeutung psycho-sozialer Faktoren in der Kardiologie [Position paper on the importance of psycho-social factors in cardiology] *Der Kardiologe*, Vol.1, pp. 7 -27 [in German].

[18] **MEISSNER, M., RIESER, S.,** (2011). Mehr Psychokardiologie täte not [More psychocardiology is needed], *Deutsches Ärzteblatt*, Vol. 48, pp. 2589 -2592 [in German].

[19] **MELLE, J. P. v., et al.** (2004) Prognostic association of depression following myocardial infarction with mortality and cardiovascular events: a meta- analysis. *Psychosom.Med*. Vol. 66, pp. 22-814.

[20] **MÖLLER-LEIMKÜHLER, A. M.** (2000). Männer und Depression: geschlechtsspezifisches Hilfesuchverhalten, Fortschritte der Neurologie [Men and Depression: Gender-Specific Help-Seeking Behavior, Advances in Neurology]. *Psychiatrie*, Vol.68, pp. 489-495.

[21] **NEUROLOGEN UND PSYCHIATER IM NETZ-PSYCHOTHERAPIE:** Negative Effekte / Auswirkungen [EUROLOGISTS AND PSYCHIATORS IN THE NETWORK-Psychotherapy: Negative Effects / Impact.] URL: https://www.neurologen-und-psychiater-im-netz.org/psychiatrie-psychosomatik-psychotherapie/therapie/psychotherapie/negative-effekte?limit=all&cHash=8de272cbcbc555abae8b3e7daed08d33 [accessed: 14.11.2022]

[22] **OTTAWA-CHARTA ZUR GESUNDHEITSFÖRDERUNG** [for health promotion] (1986). URL: https://www.euro.who.int/__data/assets/pdf_file/0006/129534/Ottawa_Charter_G.pdf [accessed: 14.11.2022]

[23] **PESESCHKIAN, H.** (2015) Positive Psychosomatik. Die Anwendung der Positiven Psychotherapie in der Psychosomatischen Medizin [Positive Psychosomatics The Application of Positive Psychotherapy in Psychosomatic Medicine], *EHK,* Vol. 64, pp.1-8. [in German]. URL: https://www.peseschkian.com/fileadmin/user_upload/PDF/Positive_Psychosomatik.pdf [accessed: 14.11.2022]

[24] **PESESCHKIAN, H., & REMMERS, A.** (2020). *Life Balance with Positive Psychotherapy*. In Messias, E., Peseschkian, H., & Cagande, C. (Eds.), Positive Psychiatry, Psychotherapy and Psychology, (pp. 91-102). Springer.

[25] **PESESCHKIAN, N.** (1977). *Positive Psychotherapie. Theorie und Praxis einer neuen Methode* [Positive Psychotherapy. Theory and practice of a new method] Frankfurt am Main, Fischer. English edition (1987), Springer Verlag.

[26] **PETZOLD, H.** (1993). *Integrative Therapie: Klinische Theorie: Das biopsychosoziale Modell* [Integrative Therapy: Clinical Theory: The Biopsychosocial Model] Vol. 2, Junfermann Verlag GmbH [in German].

[27] **ROSEMAN, R. H., CHESNEY, M. A.** (1980). The relationship of type A behavior pattern to coronary heart disease. *Act Nerv Super*, Vol.22(1), pp. 1-45.

[28] **SCHUBMANN, R., ECKELT, S., HERMES, S., LEITHÄUSER, B.** (2018). *Psycho-Kardiologie Kompakt. Verständlich auf den Punkt gebracht*, [Psycho-Cardiology Compact. Understandably to the point], Spitta-Verlag [in German].

[29] **SIEGRIST, J., APPELS, A., DE VOS, Y.** (1998). Chronic Workload', 'Need For Control' And 'Vital Exhaustion' In Patients With Myocardial Infarction And Controls: A Comparative Test Of Cardiovascular Risk Profiles, *Stress & Health,* Vol. 13(2), pp. 117-121.

[30] **SNAITH, R. P., ZIGMOND, A. S., HERMANN-LINGEN, C., BUSS, U.** (2011). Deutsche Adaptation der Hospital Anxiety and Depression Scale (HADS) [HADS-D Hospital

Anxiety and Depression Scale], Hogrefe-Verlag [in German].

[31] **SPEEDLING, E. J.** (1982). *Heart attack*. New York'Tavistock Publications.

[32] **SPRENGER, A., GROTE-JANZ-, C. V.** (1988) Medizinische Beratung und Herzinfarktbewältigung—Krankheitsbagatellisierung als Koproduktion von Patient und Professionellen, [Medical consultation and myocardial infarction coping-disease trivialization as patient-professional coproduction] *Psychosoziale Kardiologie,* pp. 103-111 [in German].

[33] **UEXKÜLL T. v., GEIGGES W., PLASSMANN R.** (2002) *Integrierte Medizin: Modell und klinische Praxis*. [Integrated medicine: model and clinical practice] Stuttgart, New York, Schattauer.