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# Anxiety and Coping Based on Emotions may contribute to Reduced Quality of Life in Patients with Mild Systolic Heart Failure

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## Abstract

***Aims and Scope:*** *Perception of health related quality of life (QoL) may result from the complex interplay between the severity of the disease and the patient's psyche. It the present study we assumed that anxiety and coping based on emotions may contribute to reduced QoL in patients with mild systolic heart failure (HF).*

***Methods:*** *We examined mainly males with systolic HF (almost all with ischemic etiology of HF, all classified in the NYHA class II, receiving standard pharmacological treatment). Each patient underwent a physical examination, routine laboratory tests and standard transthoracic echocardiography and completed psychological questionnaires assessing: coping styles, sense of self efficacy, acceptance of illness, optimism and the level of anxiety and QoL (by Minnesota Living with Heart Failure Questionnaire).*

***Results:*** *Emotion-oriented coping was strongly positively related to an overall score reflecting QoL ($r=0.37$) as well as to both dimensions of QoL, with exceptionally high correlation with the emotional dimension ($r=0.24$ and $r=0.62$, respectively, all $p<0.05$). More reduced QoL (overall score as well as scores in both analysed dimensions) was significantly (all $p<0.05$) but weakly ($r=-0.21$, $r=-0.20$ and $r=-0.26$, respectively) related to lower acceptance of the illness. Higher level of anxiety was related to more reduced QoL (all $p<0.05$). Reduced QoL in emotional dimension was related to the tendency to avoidance-oriented coping ($r=0.26$, including also a sub style based on distraction, $r=0.34$) as well as to lower sense of self-efficacy ($r=-0.20$) and lower level of optimism ($r=-0.20$, all $p<0.05$).*

***Conclusion:*** *The results indicate that HF patients are psychologically diverse, which is not related to disease severity. However, QoL was related to emotion-oriented coping and anxiety. Psychological support for patients with HF should be focused on teaching adequate methods of coping and reducing anxiety.*

## Introduction

Heart failure (HF) is often called the modern epidemic, as it is related to high prevalence accompanied by gradually increasing incidence [1,2].Importantly, this condition is known to be characterized by particularly low quality of life (QoL) of affected patients [3,4]. It is related to the fact that HF is a chronic and terminal disease with number of limitations affecting multiple dimensions of everyday functioning of each patient [1]. As a result it is highly probable that from the patient's subjective point of view HF can be viewed as similar to other severe conditions, including for instance cancer disease. In fact, apart from the patients' subjective perception of HF, also some objective, clinical parameters (e.g. the prognosis or the frequency of hospitalizations) are similar in those conditions [5].

Surprisingly, despite the above mentioned similarities between HF and cancer (which are particularly apparent from the patient's non-professional but personal perspective), in the field of health psychology cancer disease has received much more attention as compared to HF [6]. Psycho-oncology is a sub discipline of health psychology, which is dedicated for studying psychological aspects of living with cancer [7]. As a result patients with cancer can benefit from numerous options and forms of psychological support for themselves as well as for their families and other caregivers [8]. Moreover, psychological consultations constitute an integral element of a multidimensional palliative care which is offered to majority of cancer patients [6-8].

Fortunately, nowadays there is a growing awareness that treatment of HF also requires wide and multidimensional, holistic approach [9]. There is also growing consciousness among health care providers that HF management requires the palliative approach, which should be realized by multidisciplinary team (including physicians, nurses, physiotherapists as well as psychologists [9]. That is linked to the necessity of the acquisition of basic palliative medicine skills by healthcare professionals, which includes gaining the knowledge on the psychological aspects of HF.

However, research in the field of health psychology among patients with HF is still very limited. Apart from a huge number of papers related to depression accompanying HF and apart from some analyses focused on anxiety, there are rather a single papers referring to other typically psychological phenomena, like coping strategies or self-efficacy, which might and should be investigated in this constantly growing population [6]. There are numerous studies focused on the Quality of life (QoL) of patients with HF [6]. However it should be noted that QoL comprises the phenomenon which stands on the border between psychological and somatic aspects of health status. QoL reflects highly subjective perception of the patient's well-being, which is stronglydetermined by the overall experiencing of physical limitations [6]. Emotional (psychological) and social consequences of the disease are strongly related to perceived functional limitations (including the sense of physical weakness, low energy level and fatigue) [10,11], that is why QoL should not be treated as strictly psychological variable.

On the other hand, there are suggestions that somatic determinants of QoL cannot explain the whole variance of this phenomenon among patients with HF [12]. In other words, the mental aspects of the experiencing of HF (which include all emotional, social and psychological aspects of living with HF) can be an important determinant of the overall QoL [10-12]. From the psychological point of view it is very likely that the way, in which patient perceive his/her QoL may result from his/her individual psychological characteristics determining his/her mental structure [13]. Individual

differences referring to the general attitude to life, preferred coping styles, the ability to accept the disease orproneness to experience anxiety may determine individual capability of maintain relatively normal level ofeveryday functioning despite numerous limitations associated with chronic disease [13], like HF. Perception of QoL may be the result of the complex interplay between the severity of the disease and its symptoms as well as the patient's psyche.

That is why we decided to investigate selected psychological features of patients with HF. Analysed traits included: coping styles (determining individual behaviour towards stressful situations [14], the sense of self efficacy (which is known to be reduced among patients suffering from chronic diseases [15], the acceptance of illness (which theoretically determines compliance with medical regimes [16] and life orientation referring to optimism / pessimism (which may interfere with an overall perception of all experienced limitations as well as with the level of hope [6], determining QoL. Moreover, in the present study we decided to analyse not only the level of anxiety related to an actual mental state of a patient but also anxiety defined as a stable psychological trait, an integral element of the personality [17]. All psychological features were analysed in the context of clinical variables reflecting the severity of HF as well as QoL including its physical (somatic) as well as psychological (emotional) dimension.

## Materials and Methods

### Study population

We examined patients with systolic HF hospitalized in the Centre for Heart Diseases, Military Hospital (Wroclaw, Poland), who fulfilled the following inclusion criteria:

1. A 6-month documented history of HF (New York Heart Association [NYHA] I–III classes);
2. Clinical stability with unchanged medications for 3 months preceding the study;
3. left ventricular ejection fraction, 45% as assessed by echocardiography.

Exclusion criteria were: (1) HF decomposition within 3 months preceding the study; (2) acute coronary syndrome and/or coronary revascularization during the 6 months preceding the study; and (3) any psychiatric abnormalities and associated therapy either at the time of examination or in the past.

The study was approved by the local ethics committee. All subjects gave written informed consent. The study was conducted in accordance with the Declaration of Helsinki.

### Study protocol

Each patient underwent a physical examination, routine laboratory tests and standard transthoracic echocardiography. Plasma N-terminal pro-B type natriuretic peptide ([NT-proBNP] pg/mL) was assessed using electrochemiluminescence (Elecsys 1010/2010, Roche Diagnostics GmbH). Renal function was assessed using the estimated glomerular filtration rate ([GFR] mL/minute/1.73 m2), calculated from the Modification of Diet in Renal Disease equation.

Each patient completed psychological questionnaires (all in Polish, psychometrically validated versions) assessing: coping styles, sense of self efficacy, and acceptance of illness, optimism and the level of anxiety. All patients completed also a questionnaire assessing their quality of life.

### Method

Each patient filled in the following five psychological questionnaires:

1. Coping Inventory for Stressful Situations (CISS) by Endlerand Parker (in a polish adaptation by Szczepanik, Wrześniewskiand Strelau, 1996) [14], which contains 48 items referring to behaviours which are undertaken by people during a stressful situations. CISS assess 3 general styles of coping, i.e. task-oriented coping style (based on the conviction that a source of stress is a challenge or task which can be solved), emotion-oriented coping style (characteristic for people who experience strong emotions in response to stress, like for instance fear, anger and/or tension) as well as avoidance-oriented coping style (based on behaving in a way like the stress simply does not exist or it does not matter) [14]. The last style can be divided in 2 sub styles, a sub style based on distraction (based on diverting attention from the problem by engagement in other activities)and sub style based on looking for social interactions. Each subject is asked to express the frequency with which he or she is involved in a particular behaviour defined in each item, using a scale ranging from 1 ('never') to 5 ('very often'). Main styles are diagnosed using 16 items per each style (thus the subject may get from 16 to 80 points in each style), whereas a subscales are built with 8 (distraction) and 5 (social interactions) items, thus the subject may get 8-50 and 5-25 points, respectively. In each scale and or subscale higher scores reflect higher level of the particular style / sub style [14].
2. Polish version of Generalised Self Efficacy Scale (GSES) by Schwarzer, adapted and psychometrically validated by Juczyński [15]was applied in order to measure the sense of self efficacy, i.e. the conviction of an individual regarding his/her own competence in completing tasks (by the means of behaviours, thoughts, emotions) and reaching desired goals. GSES includes 10 items, answered with a 4-point Likert type scale (1, 2, 3 and 4 mean 'no', rather no', 'rather yes' and 'yes', respectively). Higher score reflects higher sense of self efficacy [15].
3. Acceptance of Illness scale (AIS) by Felton, Revenson and Hinrichsen, adapted by Juczyński [16] is a scale dedicated for people suffering from various diseases. It contains 8 items referring to the feelings related to the health status. The subject is asked to express how much he or she accepts each of the described feeling resulting from suffering from the disease, using a scale ranging from 1 ('totally disagree') to 5 ('definitely agree').Higher scores reflect higher acceptance of illness [16].
4. Revised Life orientation test (LOT-R) by Scheier, Carver, & Bridges (1994), adapted by Poprawa i Juczynski was used in order to measure dispositional optimism (ref). The scale consistsof 10 items, among which 3 assess optimisms and 3 assess pessimism. The remaining 4 items are 4 filler items. Subjects express if he or she agree with the content of each item using a 5-point Likert scale, ranging from 4 ('strongly agree') to 0 ('strongly disagree'). Scores reflecting pessimism should be calculated inversely (4=0, 3=2, 2=3 and 0=4). As a result higher scores reflect higher level of optimism [15].
5. State Trait Anxiety Inventory (STAI) by Spieleberger, Gorsuchand Lushene (1970) and adapted by Wrześniewski, Sosnowskiand Matusik (94,95) is composed by 2 separate parts (20 items per each). First part (STAI-X1) is for the assessment of anxiety as a state (which results from the current situation) whereas the second (STAI-X2) – for the assessment of anxiety as a stable personality trail [17]. The subject is asked to describe how often he or she feels in the way described in each item using a scale ranging from 1 ('almost never') to 4 ('almost always'). Subject can get from 20 to 80 point in each part of STAI. Higher scores reflect higher anxiety [17].

Each patient completed also Minnesota Living with Heart Failure Questionnaire (MLHFQ) (18) (adapted for Polish patients by Mapi Research Institute), in which each subject is asked to express how much each of the listed 21 symptoms associated with HF limits his or her everyday functioning using a scale ranging from 0 ('no limitation in everyday functioning') to 5 ('very strong limitation in everyday functioning'). Scores may be calculated as a sum from all 21 items. Moreover, the analysis may include the physical dimension (assessed by 8 items) and the emotional dimension (assessed by 5 items). Higher scores reflect worse (more limited) QoL [17].

### Statistical analysis

Continuous variables with a normal distribution are presented as means ± standard deviations of the mean.Continuous variables without normal distribution (like the level of NTproBNP) are presented as medians with lower and upper quartiles. Categorized variables are presented as percentages. Results obtained in psychological questionnaires were calculated as a percentage of the highest possible score calculated according to the instruction for each questionnaire. Relations between variables were tested using Spearman's or Pearson's Correlatory coefficients (r), where appropriate. Differences were tested using Student's T test or U-MannWhitney test (both for independent variables), where appropriate. Results with a p value <0.05 were considered as statistically significant.

## Results

Baseline characteristics of the examined group are presented in the table 1. Majority of examined patients was males, with ischaemic aetiology of HF, classified in the NYHA class II. All of them received standard pharmacological treatment.

Results related to psychological variables (analysed as a percentage of the highest possible score, which allowed us to compare the level of those variable features) are demonstrated on the figure 1.

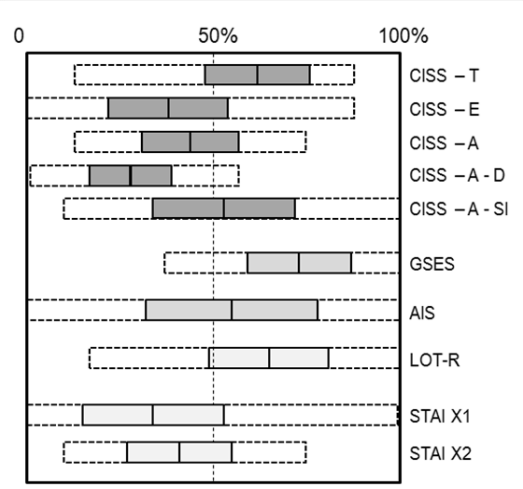


**Figure 1.** Distribution of Scores in 5 psychological questionnaires completed by 169 patients with systolic heart failure expressed as a percentage of the highest possible score

*The rectangles drawn using dashed line represent the range between the lowest (minimum) and the highest (maximum) score obtain by examined patients; The area covered by shaded rectangles ranges from -1 to +1 standard deviation from the mean score obtained by examined patients.*

*CISS: Coping Inventory for Stressful Situations; T:A subscale of CISS assessing task-oriented coping style; E:A subscale of CISS assessing emotion-oriented coping style; A:A subscale of CISS assessing avoidance-oriented coping style; CZ:A subscale of CISS assessing avoidance-oriented coping substyle based on distraction; SI:A subscale of CISS assessing avoidance-oriented coping substyle based on social interactions, GSES: Generalised Self Efficacy Scale, AIS: Acceptance of Illness Scale, LOT-R: Life Orientation Test: revised, STAI: State-Trait Anxiety Inventory; X1: a subscale of STAI assessing anxiety as a state; X2:A subscale of STAI assessing anxiety as a trait;*

Examined patients demonstrated relatively high level of task-oriented coping (mean value was above 50%), however no one received the highest or the lowest possible score. The level of emotion-oriented coping was lower, and there were patients who obtained the lowest but not the highest score. Mean value was at about 1/3 of the range 0-100%.

Similarly to task-oriented coping, answers reflecting avoidance-oriented style were less variable as compared to those reflecting emotion-oriented coping (mean was slightly below 50% and no one obtained neither 0 nor 100%). The level of avoidance-oriented coping based on distraction was low, and ranged from almost 0% to less than 60%, with the mean value around ¼ of the whole range. Answers reflecting avoidance-oriented coping based on social interaction were very variable, ranged from about 10 to 100% with the mean value close to 50%.

Self-efficacy was high, with the mean value around 75% of the range and without results lower than 25%. Answers reflecting the level of illness acceptance covered the whole range between 0 and 100%, which means that there were patients who received the lowest as well as the highest possible scores. Mean was slightly above 50%. Scores reflecting the level of optimism were relatively high; there were no results close to 0% and there were some patients who received maximal values. Mean was around 65%. Scores reflecting anxiety as a state (reflected by STAI X-1) were more variable as compared to scores reflecting anxiety as a stable personality trait (according to the results of STAI X-2), as the results of STAI-X1covered the whole range (0%-100%). Mean value was low – between 20 % and 30%. Neither the level of anxiety as a trait was slightly higher, but anyone obtained neither the lowest nor the highest score (results ranged from 10 % to 75%).

Scores reflecting QoL are demonstrated on the figure 2. QoL was not strongly reduced, as the mean overall score was 47±23 (with 21±11 (per 40) scores for physical dimension and 6±6 (per 25) for emotional dimension of QoL).

The results reflecting the relations between QoL and psychological variables are presented in table 2. The strongest relations are also demonstrated on the figure 3. There were no relations between continuous demographic and clinical variables (i.e. age and

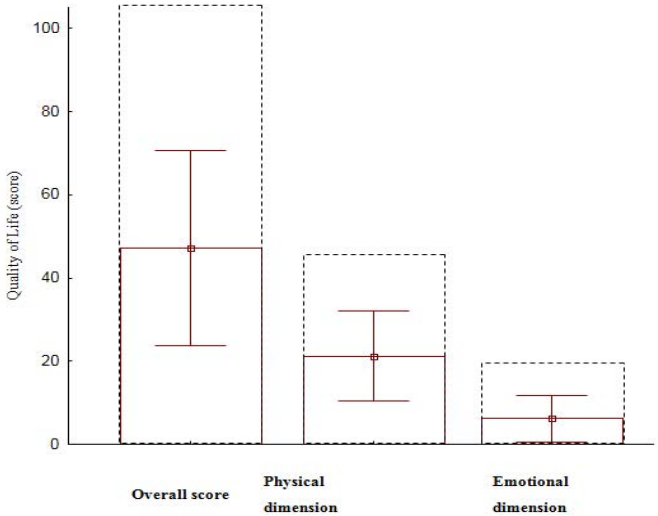


**Figure 2.** Scores reflecting reduced quality of life in 169 patients with systolic heart failure, including physical and emotional dimensions of QoL

*The dotted line represent the highest possible scores (for the overall score as well as for both dimensions of QoL)*

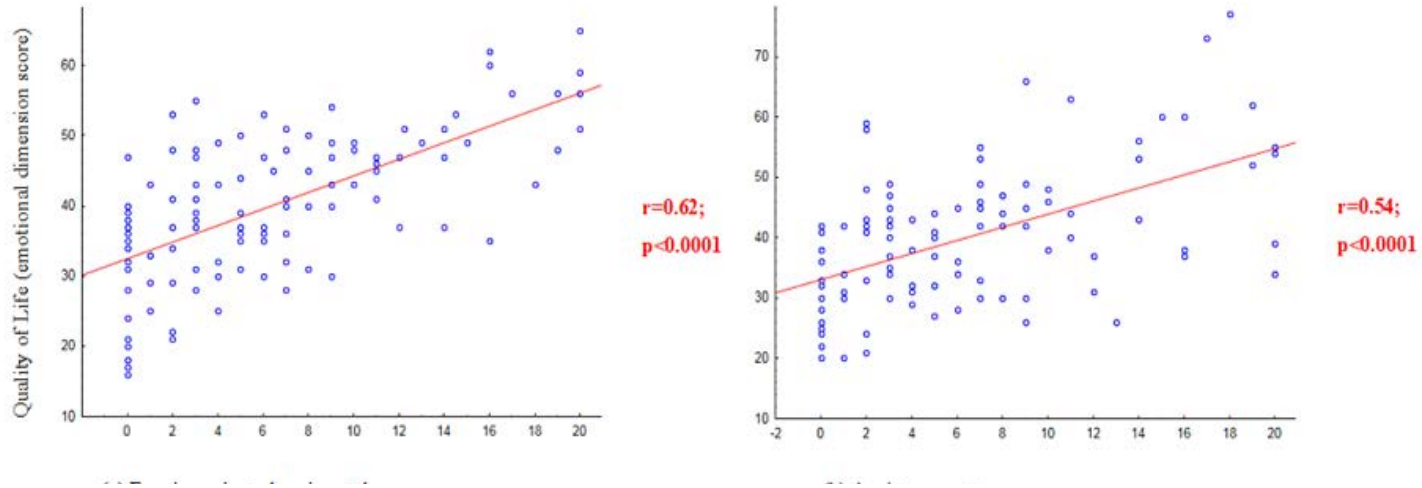


Figure 3. Relations between reduced Quality of Life(emotional dimension) and (a) Emotion-oriented coping style as well as (b) anxiety as a state in 169 patients with heart failure.

number of years since initial HF diagnosis, LVEF (%), eGFR (mL/min/1.73 m2) and NTproBNP (pg/mL)).However, there were significant relationships between psychological variables and QoL: emotion-oriented coping was strongly positively related to an overall score reflecting QoL (r=0.37) as well as to both dimensions of QoL, with exceptionally high correlation with the emotional dimension (r=0.24 and r=0.62, respectively, all p<0.05, table). More reduced QoL (overall score as well as scores in both analysed dimensions) was significantly (all p<0.05) but weakly (r=-0.21, r=-0.20 and r=-0.26, respectively) related to lower acceptance of the illness (Table 3). Higher level of anxiety (defined as a current emotional state as well as stable personality trait) was related to more reduced QoL(overall score as well as scores in both analysed dimensions; for anxiety state: r=0.28, r=0.22 and r=0.54, respectively; for anxiety – trait: r=0.29, r=0.25 and r=0.46, respectively, all p<0.05).

Moreover, reduced QoL in emotional dimension was related to the tendency to avoidance-oriented coping (r=0.26, including also a sub style based on distraction, r=0.34) as well as to lower sense of self-efficacy (r=-0.20) and lower level of optimism (r=-0.20, all p<0.05, Table 3).

| Variables (units) | Patients with HF (n=169) |
|---|---|
| Men (n, %) | 148 (88) |
| Age (years) | 63 ± 10 |
| BMI (kg/m$^2$) | 28.4 ± 5.2 |
| Time since HF diagnosis (years) | 10(5-15) |
| NYHA classes,I/II/III (n, %) | 12/106/51 (7/63/30) |
| LVEF (%) | 31 ± 7 |
| HF aetiology, CAD (n, %) | 121 (72) |
| Sodium (mmol/L) | 139 ± 3 |
| Haemoglobin (g/dL) | 13.7± 1.6 |
| Anaemia (n, %) | 48(23) |
| ID (n, %) | 48 (16) |
| eGFR (mL/min/1.73 m$^2$) | 75 ± 24 |
| CKD (n, %) | 42(25) |
| NTproBNP (pg/mL) | 977(404-2523) |
| Previous MI (n, %) | 97 (57) |
| HT (n, %) | 102 (60) |
| AF (n, %) | 60 (36) |
| Previous stroke and/or TIA (n, %) | 14 (8) |
| DM (n, %) | 58 (34) |
| COPD (n, %) | 11 (7) |
| Treatment | |
| ACE inhibitor and/or ARB (n, %) | 162 (96) |
| Aldosterone antagonist (n, %) | 123 (73) |
| β-blocker (n, %) | 167 (99) |
| Loop diuretic (n, %) | 94 (56) |
| Loop diuretic (mean dose, mg) | 20 (0-40) |
| Digoxin (n,%) | 35 (21) |
| ICD (n, %) | 126 (75) |
| CRT (n, %) | 54 (32) |
| Previous PCI (n, %) | 66 (39) |
| Previous CABG (n, %) | 46 (27) |

Table 1 Baseline characteristics of 169 patients with heart failure

*Data is presented as a mean±standard deviation, a median with lower and upper quartiles, or numbers with percentages, where appropriate; *p<0.05; **p<0.01; ***p<0.001*

*HF: Heart Failure;BMI: Body Mass Index; NYHA: New York Heart Association; LVEF: Left Ventricular Ejection Fraction; CAD: Coronary Artery Disease; eGFR: Estimated Glomerular Filtration Rate Calculated using MDRD Formula (MDRD - Modification of Diet in Renal Disease); MI: Myocardial Infarction; HT: Hypertension; AF: Atrial Fibrillation; TIA: Transient Ischaemic Attack; DM: Diabetes Mellitus; CKD: Chronic Kidney Disease; COPD: Chronic Obstructive Pulmonary Disease; ACE: Angiotensin Converting Enzyme; ARB: Angiotensin Receptor Blocker; ICD: Implantable Cardioverter-Defibrillator; CRT: Cardiac Resynchronization Therapy; PCI: Percutaneous Coronary Intervention; CABG: Coronary Artery Bypass Graft.*

*Anaemia was defined as haemoglobin level < 12 g/dL for men and <13 g/dL for women; CKD was defined aseGFR<60 mL/min/1.73 m2; ID was defined as serum ferritin >100*

| | Coping styles | | | | | Self efficacy | Illness acceptance | Life orientation | Anxiety | |
|---|---|---|---|---|---|---|---|---|---|---|
| variables | T | E | A | A-D | A-SI | | | | State | Trait |
| QoL | - | 0.37 | - | - | - | - | -0.21 | - | 0.28 | 0.29 |
| QoL-P | - | 0.24 | - | - | - | - | -0.2 | - | 0.22 | 0.25 |
| QoL-E | - | 0.62 | 0.26 | 0.34 | - | -0.2 | -0.26 | -0.2 | 0.54 | 0.46 |

Table 2. Relations between all examined psychological variables and Quality of Life, including its physical as well as emotional dimension in 169 patients with systolic heart failure

*Data is presented as linear correlatory coefficients with $p<0.05$.*

*QoL: Quality of Life; QoL-P:Physical Dimension of Quality of Life; QoL-E:Emotional Dimension for Quality of Life; T:A subscale of CISS assessing task-oriented coping style; E:A subscale of CISS assessing emotion-oriented coping style; A:A subscale of CISS assessing avoidance-oriented coping style; A-D:A subscale of CISS assessing avoidance-oriented coping substyle based on distraction; SI:A subscale of CISS assessing avoidance-oriented coping substyle based on social interactions; CISS: Coping Inventory for Stressful Situations*

## Discussion

According to our knowledge, this is the first study with an analysis of a whole set of psychological variables, which have been previously comprehensively studied within the broad field of health psychology, in the context of QoL of patients with HF.

Firstly, the results obtained using all applied psychological measures enable us to characterize the examined group of patients with HF in term of their coping styles, sense of self efficacy, acceptance of illness, optimism and anxiety. Importantly, the examined group appeared to be highly variable in term of psychological characteristics.

In particular, regarding the styles of coping with stressful situations, health psychology suggests that while facing a stressor resulting from suffering from chronic disease (which require following complex pharmacological regimes and changing the lifestyle) task-oriented approach is the most favourable solution (19). Fortunately, this style was the most pronounced style among the examined patients. It means that HF patients can interpret their illness as the challenge which has to be met. This is particularly promising in the context of a fruitful cooperation between the patient and the physician including compliance with the physician's recommendations.

On the other hand,presented results indicate huge diversity of the scores reflecting emotion-oriented coping style, whichshould be viewed as alarming. According to premises from health psychology, emotion-oriented coping style is not adequate while coping with somatic disease [14,19]. This approach is rather recommended for stressors which cannot be influenced by a patient or for stressors which simply require the passage of time to be overcome (like e.g. the mourning after the loss of a close person). In the case of somatic illness, requiring active management (based on medication taking and changing the lifestyle) patient should not focus on emotional burden resulting from experiencing the disease [14]. That is why, although the mean results reflecting the patients preferences towards emotion-oriented coping were not high, we have to be conscious that there are patients in whom this style is significantly pronounced.Those patients probably require support, because it is highly probable that HF constitutes significant psychological burden for them.

Results reflecting the level of avoidance-oriented coping style were low and not much variable. It can be interpreted as beneficial, as avoidance-oriented coping style is known as least favourable approach for people suffering from chronic disease. This is related to the fact that avoidance-oriented coping includes behaviours leading to noncompliance. Patient demonstrating this style tries not to think about his or her illness, thus she or he may behave as a healthy person, who does not need to follow medical advice [14]. On the other hand, it should be underlined that results reflecting avoidance coping based on social interactions were relatively high and also variable. It means that social interactions may be helpful in coping with HF. It may provide a suggestion about the potential method of helping patients with HF: perhaps psychological interventions offered to patients with HF should be based on group therapy.

HF patients demonstrated also surprisingly high level of sense of self efficacy, which is typically reduced among patients with chronic diseases [15]. This is concordant with our previous results [20]. Such psychological profile is favourable, as high self-efficacy is related to the conviction of the effectiveness of individual activity. We can suspect that it may include also activities related to HF management.

Regarding the acceptance of illness, the results were characterized by the greatest diversity. This means that there are patients who fully accept the disease, but there are also those who do not accept it completely. There is evidence suggesting that acceptance of the disease is crucial in the context of health behaviour which includes compliance with medical regimes [21]. That is why encouraging patients with HF to accept their illness constitute an important challenge for psychologists and psychotherapists who should support healthcare providers within the multidisciplinary palliative care for patients with HF.

Patients with HF demonstrated moderately high level of optimism. This is important and valuable information, because optimism is essential to accept life despite all problems and disturbances, also those related to health [15].

Regarding the level of anxiety, anxiety-state was almost as diverse as the level of illness acceptance; however the mean value was lower. This means that patients with HF do not exhibit particularly high level of fear; however, the wide range of variation of the results of STAI-X1 indicates that there are patients experiencing extreme anxiety. Regarding the results of STAI-X2, it appears that the level of anxiety is relatively low and not very varied among the studied population. Such data is favourable, as higher level of anxiety-trait predisposes to experiencing anxiety or even depression towards any difficult situations [17].

In the present study we analysed the relationships between the patients' psyche, and clinical variables reflecting HF severity (which were not present), as well as the patient's QoL (which were significant, and – in some cases – relatively strong).

Lack of any relationships between clinical variables and psychological features may result from the fact that examined group was highly homogenous according to the severity of HF. Patients were classified in NYHA functional classes I-III (without representants of NYHA IV), with a vast majority in NYHA II. All patients were clinically stable. Perhaps psychological studies including both stable patients as well as patients experiencing HF worsening would reveal significant relationships between the patients' psychological status and their clinical characteristics. The

fact that almost all examined patients were in NYHA II may have also influence on the level of QoL, which was not significantly reduced among the examined group.

Our results showed that the following relations between QoL and psychological variables: higher overall score (reflecting more reduced QoL) as well as scores reflecting both dimensions of QoL were related to higher level of emotion oriented-coping style, as well as lower acceptance of the illness and higher level of anxiety. Emotional dimension of QoL was related to all analysed features. This is particularly important, as emotional dimension of QoL contributes to its overall level [18]. Moreover, it is highly probable that higher level of selected psychological variables determines the way in which the patient perceives his / her QoL [12]. Patients who preferred emotion-oriented coping style demonstrated more reduced emotional QoL. Lower emotional QoL was also characteristic for patients demonstrating the tendency to avoidance-oriented style (including avoidance based on distraction), those with lower sense of self-efficacy, lower acceptance of illness and lower level of optimism. Both applied measures of anxiety were positively related to emotional QoL, which means that the higher the anxiety the more reduced QoL.

From the psychological point of view it can be suggested that such characteristics, i.e. focusing on bad emotions in response to a stressor instead of active coping, low sense of self efficacy and lack of illness acceptance are typical for lack of motivation [19]. Patients having such mental constitution may be less actively involved in the management of HF. That may result in additional worsening of HF symptoms, which affects QoL [12]. High level of anxiety as well as lack of optimism predispose to experiencing psychological burden including hopelessness and clinical depression [19], which may directly affect emotional QoL.

## Conclusion

The results indicate that HF patients are psychologically diverse, which should be taken into account while implementing multidimensional model of care. Among clinically homogenous group of patients with stable and mild HF, psychological characteristics were independent of clinical parameters reflecting disease severity. There were significant relations between QoL and psychological features (especially emotion-oriented coping, anxiety and emotional dimension of QoL), which are probably related to the fact that mental constitution of a patient determines his or her attitude towards the disease, affecting both health behaviours as well as the perception of QoL. Analysed psychological features are modifiable, thus the psychological support considered while implementing multidisciplinary care in patients with HF should be focused on evaluatingand influencing the patients' psyche, with the special emphasis on teaching an adequate methods of coping and reducing anxiety (Tables 1,2) (Figures 1,2).

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