

Self-assessment and Screening for Palliative Care Need in Patients with Chronic Heart Failure

Karin Oechsle^{1*}, Jennifer Ehlert¹, Yskert von Kodolitsch², Anneke Ullrich¹, Carsten Bokemeyer¹ and Meike Rybczynski²

¹Department of Oncology, Hematology and Bone Marrow Transplantation, Palliative Care Unit, University Medical Center Hamburg-Eppendorf, Hamburg, Germany

²Department of Cardiology, University Heart Center Hamburg-Eppendorf, Hamburg, Germany

*Correspondence author: Karin Oechsle, Department of Oncology, Hematology and BMT, University Medical Center Hamburg-Eppendorf, Martinistr. 52, 20246 Hamburg, Germany, Tel: 49/40/7410-58774; Fax: 49/40/7410-58841; E-mail: k.oechsle@uke.de

Received date: Apr 8, 2017; Accepted date: Apr 29, 2017; Published date: May 4, 2017

Copyright: © 2017 Oechsle K, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Abstract

Objective: Patients with chronic heart failure (CHF) rarely receive palliative care today.

Methods: In a cross-sectional pilot study we evaluated feasibility of self-assessment and physician-directed screening for palliative care need in CHF patients. Patients answered German versions of the "Minimal Documentation system for patients in palliative care" (MIDOS), "Distress-Thermometer" (DT), and the "Patient Health Questionnaire" (PHQ4). A modified version of the "Five-Item Palliative Care Screening Tool" was used to screen for palliative care need by the treating cardiologists.

Results: 218 patients were asked to participate and 148 (67%) completed all questionnaires. Median symptom burden (MIDOS) was 7 out of 30 points (SD 4.868), overall wellbeing was two of 5 (SD 0.902), and median distress score was 6 of 10 (SD 2.318). Most frequent moderate or severe symptoms were dyspnea (52%), weakness (51%), and tiredness (49%). Significant distress (DT score>5) was indicated by 106 patients (72%). Exhaustion (79%), sleeping problems (75%), and problems with breathing (69%) were most frequent problems. Only 11% and 14% of patients presented with significant anxiety and depression, respectively (PHQ4-score>3).

Palliative care need was scored with mean 6.8 out of 12 points (SD 2.223). Using a cut-off value of >5, 113 patients (76%) would have needed palliative care. Objective parameters for palliative care need (symptom burden 43%, distress 68%, decision-making 67%) were indicated, but request for palliative care by the patients, their relatives (5%) or the cardiology team (5%) was rare. Symptom burden and palliative care screening showed significant, but not clinically relevant interaction.

Conclusion: This pilot study, feasibility of palliative care self-assessment and the modified screening instrument could be demonstrated in CHF patients. For comprehensive screening, both perspectives have to be included. First results indicate significant symptom burden, psychological distress and a high need for additional palliative care in CHF patients.

Keywords: Palliative care; Heart failure; Cardiology; Symptom burden; Screening; Self-assessment; Distress; Anxiety; Depression

Introduction

Palliative care addresses problems and needs of patients with advanced progressive or life-threatening diseases in general, but usually about 90% of patients receiving specialist palliative care suffer from advanced cancer [1,2]. However, several clinical studies indicate that patients with chronic heart failure exhibit comparable symptoms and problems, quality of life, recurrent hospitalizations and survival prognosis with advanced cancer patients [3-5]. These studies suggest even higher rates of severe dyspnea, psychological distress, and depression, as well as lower spiritual wellbeing [3,4]. Other studies report various unmet palliative care needs in patients with advanced heart failure [6,7]. Although some studies suggest beneficial effects of palliative care consultation [8-12], less than 10% of patients with heart failure receive palliative care today [13,14].

Various studies analyzed potential barriers responsible for this almost lacking integration of palliative care in patients with advanced cardiologic diseases [2,15-19]. Potential reasons may be that the estimation of prognosis and trajectory of disease is considered more difficult than in cancer patients [2,17,18]. In contrast to oncology clinics, there are usually no established interactions, cooperation or communication structures between cardiology and palliative care specialists [2,15,19]. A limited understanding of the other specialist discipline hampers a professional collaborative approach to the specific patients' needs [15-17]. In the context of cardiologic diseases, palliative care is usually considered to be restricted to end-of-life care and cardiologists, but also the patients themselves and their family caregivers usually have no or only little knowledge about the potential benefits of palliative care in chronic heart failure patients [15,16,20]. The most crucial reason seems to be the absence of criteria or trigger points defining the optimal time frame to initiate palliative care [2,16,17]. Until today, preliminary approaches using screening instruments for palliative care need in patients with chronic heart failure could not be established in daily practice [14,21-23].

Therefore, this pilot study aimed to evaluate feasibility of self-assessment and screening instruments well established in daily clinical palliative care practice in advanced cancer patients or palliative care patients in general that were partly modified for use in patients with chronic heart failure. In addition, the different measurements were compared to identify overlapping information to prospectively create a minimal set of instruments. Finally, we retrieved some first explorative results on symptom burden, psychological distress, and palliative care need in patients with chronic heart failure.

Patients and Methods

Study design and inclusion criteria

This pilot study evaluated measurements for potential palliative care need in patients with chronic heart failure during cardiologic inpatient treatment at the University Heart Center of Hamburg-Eppendorf, Germany. Due to the explorative character, we used a cross-sectional design including patients at any time during their stay on an inpatient ward of the University Heart Center and at any time during the total course of their heart failure disease. Therefore, inclusion criteria were presence of a cardiologically diagnosed chronic heart failure, treatment on an inpatient ward of the University Heart Center, age >18 years, sufficient cognitive function, and adequate knowledge of German language to answer the questionnaire (estimated by the treating cardiologist). All patients had to give written informed consent prior to study inclusion. The local ethics committee of the General Medical Council of Hamburg approved the study protocol (PV 5010).

Study aims

This study aimed to evaluate the practicability of measurements in patients with chronic heart failure that were primarily developed for and validated in cancer patients or in palliative care patients in general (with cancer patients being the major group). We used tools for subjective self-assessment of symptoms and psychological problems [24-26] as well as a screening tool for palliative care needs assessed by professional caregivers [27] to include the patients' and the professionals' views. Long-term aim realized by a following larger study will be the development and validation of a short screening instrument indicating palliative care need in patients with chronic heart failure in daily clinical routine.

Further, this pilot study revealed some first explorative results on symptom burden, psychosocial distress and palliative care need in patients with chronic heart failure including the patients' and the cardiologists' perspective.

Measurements

Symptom burden and psychological distress: The patients' self-assessment questionnaires included German versions of three standardized and validated instruments that were regarded as standard instrument for specialized palliative care assessment in daily practice in Germany. Symptom burden was assessed by the MIDOS symptom questionnaire (Minimal Documentation system for patients in palliative care) [24]. Psychological distress and potential causing factors were measured by the Distress-Thermometer of the National Comprehensive Cancer Network (NCCN) [25,28]. For screening for anxiety and depression the PHQ4-questionnaire (Patient Health Questionnaire) was used [26,29].

The MIDOS questionnaire [24], a German version of the Edmonton Symptom Assessment Scale (ESAS) [30], includes 10 symptoms (pain, nausea, emesis, dyspnea, constipation, weakness, loss of appetite, tiredness, sadness, and anxiety). Patients had two rate these 10 symptoms on a four-point scale from "0=no" up to "3=severe". In addition, the patients had to score their subjective overall wellbeing on a five-point scale from "0=very good" to "4=very bad".

The Distress Thermometer (DT) [25,28] assesses the psychological burden within the last 7 days on an 11-point-Likert-scale range from "0=no distress" up to "10=extreme distress". Scores of >5 indicate clinically relevant psychological distress. In addition, 36 problems from five categories (practical, family, emotional, spiritual, and physical problems) potentially causing distress could be attributed with "yes" and "no".

The 4-item PHQ-4 questionnaire (Patient Health Questionnaire) is a combination of the GAD-2 (General Anxiety Disorders Scale) and PHQ-2 questionnaires [26,29]. In the 2-item PHQ-2, a short form of the PHQ-9, two items assess the frequency of depressive symptoms within the past week. They are scored on a four-point Likert scale rated from "0=not at all" to "3=nearly every day" with scores >3 indicating depression [26,31]. In the two-item GAD-2, a short form of the GAD-7 [32], two items assess anxiety symptoms within the past week. Scales are scored on a four-point Likert scale rated from "0=not at all" to "3=nearly every day". A score of >3 indicates anxiety [26,29]. The PHQ-4 total score ranges from 0-12 and scores of 0-2 can be interpreted as normal, 3-5 as mild, 6-8 as moderate and 9-12 as severe [26,29].

Screening for palliative care need: A modified version of the "Five-Item Palliative Care Screening Tool" developed by Glare et al. was used to screen for potential palliative care need by the treating cardiologists [27,33]. The "Five-Item Palliative Care Screening Tool" was developed to screen advanced cancer patients for their potential palliative care need. To apply this screening instrument in patients with chronic heart failure, we replaced "metastatic or locally advanced cancer" in screening items 1 and 3 with "chronic heart failure" and we deleted typically cancer-associated complications from item 3. In item 2, we replaced the "Functional status score according to the Eastern Cooperative Oncology Group" with "functional status according to the NYHA-classification" (New York Heart Association). In item 4, we deleted the potential co-morbidity "chronic heart failure" and added "advanced malignant disease" instead. Item 5, including all sub-items of palliative care problems, were adopted without modifications. The modified "Five-Item Palliative Care Screening Tool", which will be now called "Palliative Care Screening Tool for heart failure patients", is presented in Table 1.

Statistical analysis: Descriptive statistics including mean, median, standard deviations, and frequencies were determined. Internal consistency of the "Palliative Care Screening Tool for heart failure patients" was assessed by Cronbach's alpha coefficient and was considered satisfactory when $\alpha > 0.70$ [34]. We conducted a series of correlation analyses between variables reflecting symptom burden and psychological distress and the sum score of "Palliative Care Screening Tool for heart failure patients" "Depending on the data's level of measurement, bivariate associations were calculated by either Pearson's or Spearman's tests to assess the relative magnitudes of the associations between variables. Following Cohen [35], a correlation of 0.2 was considered to be low, a correlation of 0.5 to be medium strength, and a correlation of 0.8 to be strong.

Five candidate variables were studied in a multivariate linear regression analysis (age, gender, MIDOS sum score, distress thermometer score, and PHQ-4 score) with the sum score of “Palliative Care Screening Tool for heart failure patients” being the dependent variable. Testing of assumptions for linear regression was conducted before analysis. Multicollinearity assessment showed intercorrelations of ≥ 0.5 between the MIDOS sum score and distress thermometer, resulting in the exclusion of the latter. Within the regression model, we

applied a backwards variable selection procedure, and Analysis of Variance (ANOVA) of regression was used to demonstrate the significance of the whole model.

All significance tests were two-tailed using a significance level of $\alpha < 0.05$. All analyses were performed using SPSS Statistics software version 24.0 (IBM, USA).

Screening items		Points
1	Presence of chronic heart failure	1
2	Functional status according to the NYHA-classification	1-4
3	Presence of one or more serious complication of chronic heart failure usually associated with a prognosis of <12 months	1
4	Presence of one or more serious co-morbid disease also associated with poor prognosis (e.g. moderate-severe COPD, advanced malignant disease, dementia, AIDS, end-stage renal failure, end stage liver cirrhosis).	1
5	Presence of palliative care problems	
a	Symptoms uncontrolled despite of cardiologic treatment	1
b	Moderate to severe distress in patient and/or family related to chronic heart failure diagnosis or therapy	1
c	Patient and/or family concern about course of disease and decision making	1
d	Patient and/or family request palliative care consult	1
e	Cardiologic team needs assistance with complex decision making or determining goals of care	1
Total score		0-12
NYHA: New York Heart Association		

Table 1: “Palliative Care Screening Tool for heart failure patients” (modified from Glare et al. [27,33]).

Results

Patient characteristics

Between 1st April 2015 and 31st March 2016 (interrupted for 8 weeks due to severe illness of study personal), a total of 218 patients with chronic heart failure were admitted to the Heart Failure Unit of the University Heart Center and were asked for study participation. Finally, 148 patients (67%) were willing to participate. Patients completed all questionnaires thoroughly, with only little proportions of missing data (<5% per item). Median age of these 148 patients was 67.5 years (SD 14.3; range: 18-90). For patient characteristics including details on chronic heart disease and clinical presentation (Table 2).

Symptom burden and distress

Patients rated their symptom burden measured by the MIDOS sum score with a median of 7 out of maximum 30 points (23%; mean 7.87; SD 4.86; range: 1-21). “Moderate” or “severe” intensity was scored in a median number of two out of 10 symptoms (SD 1.85; range: 0-7). The most frequent symptoms of “moderate” or “severe” intensity were dyspnea in 77 patients (52%), weakness in 75 (51%), and tiredness in 72 (49%).

Patients rated their overall wellbeing on the 5-point Likert scale with a median score of two (mean 1.99; SD 0.90; range: 0-4).

Median score of the Distress Thermometer was 6.0 (mean 5.83; SD 2.31; range: 0-10). Overall, 106 patients (72%) reported scores of >5 which indicates significant psychological distress in cancer patients [25]. In the list of problems considered responsible for their psychological distress, patients indicated an average of 0.4 out of 5 practical problems (8%; SD 0.74; range: 0-3). Average number of family problems was 0.3 out of 2 (15%; SD 0.67; range: 0-2), emotional 2.0 out of 6 (30%; SD 2.22; range: 0-6), spiritual 0.15 out of 2 (8%; SD 0.47; range: 0-2), and 7.7 out of 19 physical problems (41%; SD 4.29; range: 0-19). Exhaustion (79%), sleeping problems (75%), problems with breathing (69%), and decreased mobility and activity (68%) were the most frequently complained problems. Table 3 presents the detailed results.

The total PHQ-4 score was low with 1.0 in median (mean 2.22; SD 2.48; range: 0-12). Patients presented without any evidence for anxiety/depression in 61% as well as mild and moderate in 30% and 9%, respectively. None of these patients showed severe anxiety/depression in the PHQ-4 screening. Assuming a cut-off-value of >3 for both scales as giving evidence for anxiety or depression, only 11% and 14% of patients presented with anxiety and depression, respectively.

Palliative care screening

The mean score on the “Palliative Care Screening Tool for heart failure patients” indicated by the treating cardiologist was 6.8 out of a maximum of 12 possible points (median 7.00; SD 2.22; range: 0-12). Details are presented in Table 4.

Characteristics		N pts	%
Gender	Female	45	30
	Male	103	70
Subtype of chronic heart failure	Ischemic Cardiomyopathy (CMP)	79	53
	Valvular CMP	40	27
	Acute myocardial infarction	11	7
	Acute cardiac decompensation	7	5
	Vascular disease	5	3
	Cardiac arrhythmia	4	3
	Cardiogenic shock	2	1
Comorbid conditions	Chronic renal insufficiency	57	39
	Diabetes Mellitus Type II	50	34
	Pulmonary co-morbidity	35	24
	Malignant co-morbidity	28	19
	Neurologic co-morbidity	23	16
	Nicotine abuse	33	22
	Adipositas	22	15
	Psychiatric-psychological disease	14	10
	Hypothyreosis	14	10
	Hyperthyreosis	10	7
	Alcohol abuse	7	5
Chronic heart failure-associated co-morbidities	Arterial hypertension	75	51
	Atrial fibrillation	63	43
	Peripheral edema	58	39
	Peripheral arterial occlusive disease	50	34
	Previous cardiac surgery	41	28
	Implanted cardiac pacemaker	31	21
	Left ventricular assist device	11	7
	Previous reanimation therapy	7	5
	High urgency status for transplantation	6	4
	Decompensation of prothrombin time	5	4
N pts: Number of Patients; NOS: Not Otherwise Specified			

Table 2: Patient characteristics: N pts=148.

Interestingly, the treating cardiologists recognized objective parameters for palliative care need, like symptom burden (43%), distress (68%) or decision-making (67%), frequently. In contrast, request for palliative care by the patient or relatives (5%) or the cardiology team (5%) was indicated very rarely.

Using the cut-off value of >5 of the original version of the “Five Item Palliative Care Screening Tool” for cancer patients by Glare et al. [14,20] as indicator for palliative care need, 113 patients (76%) would have needed additional palliative care (Table 5).

The internal consistency of the “Palliative Care Screening Tool for heart failure patients” was Cronbach’s $\alpha=0.580$, indicating multidimensionality of the screening tool.

Symptom	No	Mild	Moderate	Severe
	N pts (%)	N pts (%)	N pts (%)	N pts (%)
Pain	79 (53%)	50 (34%)	14 (10%)	5 (3%)
Nausea	118 (80%)	26 (18%)	2 (1%)	2 (1%)
Emesis	134 (91%)	10 (7%)	3 (2%)	1 (1%)
Dyspnea	46 (31%)	25 (17%)	44 (30%)	33 (22%)
Constipation	89 (61%)	40 (27%)	12 (8%)	6 (4%)
Weakness	25 (17%)	48 (32%)	46 (31%)	29 (20%)
Loss of appetite	61 (41%)	50 (34%)	24 (16%)	13 (9%)
Tiredness	28 (19%)	48 (32%)	39 (27%)	33 (22%)
Sadness	109 (74%)	24 (16%)	12 (8%)	3 (2%)
Anxiety	94 (64%)	38 (26%)	13 (9%)	3 (2%)
N pts: Number of Patients				

Table 3: Symptoms and problems (MIDOS [24]): N pts=148.

Problem present	N pts	%
Practical problems		
Living situation	20	14
Insurance	3	2
Transportation/mobility	8	6
Employment/school	16	11
Child care	14	10
Family problems		
Relationship with partner	27	18
Relationship with children	19	13
Emotional problems		
Sorrows	78	53
Anxiety	57	39
Sadness	50	34
Depression	26	18
Nervousness	46	32
Loss of interests on daily activities	42	29
Spiritual problems		
Loss of trust	8	5
Spiritual aspects concerning god	15	10

Physical problems		
Pain	72	49
Nausea	32	22
Exhaustion	115	79
Sleeping problems	110	75
Mobility/activity	100	68
Washing/clothing	66	45
External appearance	41	28
Breathing	102	69
Inflammation in the mouth	27	19
Digestion problems	57	39
Problems with eating/diet	54	37
Constipation	57	39
Diarrhea	9	6
Problems with urinary	39	26
Fever	10	7
Dry or itching skin	60	41
Dry or stuffy nose	18	12
Tingling sensation in Fingers/toes	53	36
Feeling bloated	57	39
Cognitive problems/concentration	49	33
Sexual problems	14	9
N pts: Number of Patients		

Table 4: Problem list of the Distress Thermometer [25]: N pts=148.

Interaction between measurements

The “Palliative Care Screening score” significantly correlated with the symptom total score (MIDOS; $r=0.235$; $p=0.004$) and psychological distress (DT; $r=0.189$; $p=0.022$), but not with overall well-being ($r=-0.118$; $p=0.155$) or anxiety/depression (PHQ-4; $r=0.117$; $p=0.157$). It was also not correlated with age ($r=0.027$; $p=0.749$) or gender ($r=0.104$; $p=0.206$). In contrast, symptom burden (MIDOS) correlated significantly with all other parameters: overall well-being ($r=0.544$; $p<0.001$), anxiety/depression (PHQ-4; $r=0.383$; $p<0.001$), distress (DT; $r=0.555$; $p<0.001$), age ($r=0.251$; $p=0.002$), and gender ($r=0.255$; $p=0.002$). Within the regression model, the symptom burden (MIDOS) was the only variable with significant effects on the “Palliative Care Screening score” based on 95% CI (unstandardized regression coefficient $B=0.107$, standard error=0.037, Beta=0.235, $t(2,915)$ $p=0.004$, 95% CI=[0.035, 0.180]). Age, gender, and anxiety/depression (PHQ-4) were eliminated from the original regression model. R squared and adjusted R squared of the final regression results were 0.055 and 0.049, respectively. The selected model with symptom burden as single explanatory variable was statistically significant ($F(1,146)=8.500$, $p=0.004$), but not clinically relevant.

Screening items		N pts	%
1	Presence of chronic heart failure	148	100
2	Functional status NYHA 1	22	15
	Functional status NYHA 2	37	25
	Functional status NYHA 3	53	36
	Functional status NYHA 4	36	24
3	Presence of one or more serious complication of chronic heart failure usually associated with a prognosis of <12 months	87	56
4	Presence of one or more serious co-morbid disease also associated with poor prognosis (e.g. moderate-severe COPD, advanced malignant disease, dementia, AIDS, end-stage renal failure, end stage liver cirrhosis).	120	81
5	Presence of palliative care problems		
a	Symptoms uncontrolled despite of cardiologic treatment	63	43
b	Moderate to severe distress in patient and/or family related to chronic heart failure diagnosis or therapy	100	68
c	Patient and/or family concern about course of disease and decision making	99	67
d	Patient and/or family request palliative care consult	7	5
e	Cardiologic team needs assistance with complex decision making or determining goals of care	8	5
N pts: Number of Patients; NYHA: New York Heart Association			

Table 5: Results of the “Five Item Palliative Care Screening Tool for heart failure patients”.

Discussion

This cross-sectional study evaluated the feasibility of a set of self-assessment instruments well established in advanced cancer patients [24-26] as well as a modified screening tool for palliative care needs [27] in patients with chronic heart failure. Self-assessment of symptom burden and psychological distress as relevant indicators of palliative care need was applicable using the MIDOS and PHQ-4 questionnaires plus the distress thermometer in patients with advanced heart failure. Overall, 67% of patients who were invited to participate in this questionnaire analysis could be included. Questionnaires were completed in full by almost all patients. The corresponding cardiologists declared that the questionnaires appeared to them to be applicable in patients with chronic heart failure and they completed the “Palliative Care Screening Tool for heart failure patients” for all patients.

We correlated the different measurements to identify overlapping information aiming to define a minimal set of instruments revealing the highest gain of information with lowest effort for the patients and their treating cardiologist. Within the regression analysis, age, gender, and PHQ-4 score were eliminated as they were not of additional information. The final regression model demonstrated a statistically significant, but clinically not sufficient variance explanation of 5.5% for the “Palliative Care Screening Tool” with the MIDOS score being the only predictor variable. Therefore, a combination of self-assessment using the MIDOS questionnaire and external screening using the modified “Palliative Care Screening Tool” seems to be the most practicable set of measurements that will be prospectively validated in an ongoing study. It also demonstrates that in cardiologic patients both perspectives - of the patients themselves and their professional caregivers - have to be taken into account. A Canadian study using the original ESAS symptom questionnaire and the externally assessed

Palliative Care Performance Scale [36] also suggests a combination of symptom burden self-assessment (ESAS/MIDOS) plus a palliative care screening tool as most suitable daily clinical practice.

Secondly, this pilot study aimed to reveal some first explorative results on symptom burden, psychological distress and potential palliative care need in patients with chronic heart failure. Self-assessed symptom burden was moderate with median scores of 7 out of 30 points (23%). Patients classified about 20% of symptoms as of “moderate” or “severe” intensity. The most frequent symptoms of moderate or severe intensity were dyspnea, weakness, and tiredness. Previous studies using palliative care measurements in patients with chronic heart failure have described fatigue and anorexia/loss of appetite as the two most frequent distressing symptoms [4,36]. Dyspnea was less frequent in previous studies [4,36], but this might be explained by the fact that in our study, patients were included in a timely manner after admission to inpatient cardiologic care due to decompensation of their heart failure. Similarly, one of these studies described impaired well-being in only 20% of patients with severe heart failure (NYHA III/IV) [34], while in our study the patients’ overall wellbeing was moderate in general.

Psychological distress was high with a median score of 6. Assuming a cut-off-value of >5 indicating significant psychological distress in cancer patients [25], 72% of patients with chronic heart failure presented with significant distress in this study. Patients considered physical and emotional problems most frequently to be responsible for their psychological distress. Exhaustion, sleeping problems, problems with breathing, and increased mobility and activity were the most distressing problems. In contrast, only 11% and 14% of patients presented with indicators for anxiety or depression, respectively.

Palliative care need assessed by external screening using the "Palliative Care Screening Tool for heart failure patients" was scored with 6.8 out of a maximum of 12 points. Using the cut-off value of >5 of the original version of the "Five Item Palliative Care Screening Tool" by Glare et al. validated in cancer patients as indicator for palliative care need [27,33], almost 80% of patients would have needed palliative care. Interestingly, the treating cardiologists recognized objective parameters for palliative care needs, like symptom burden, distress or decision-making quite frequently. In contrast, the request for palliative care by the patient, relatives or the cardiology team was indicated rarely (5% each). This is in correspondence to previous studies demonstrating that cardiologists and their patients restrict palliative care to end-of-life care and have no specific ideas about integrating palliative care in earlier phases of the disease trajectories [15,16,20].

This pilot study was designed as a feasibility and explorative study, which exhibits methodical limitations. The explorative data on symptom burden, distress, and palliative care need can only be interpreted as hypotheses generating, especially as the final validation of the "Palliative Care Screening Tool for heart failure patients" is pending. Prospective studies with larger patient cohorts have to evaluate these parameters and further randomized trials have to examine beneficial effects of palliative care in correspondence to their indicated need. Further, it has to be noticed that only few socio-demographic or disease-related factors were assessed in this pilot study. Therefore, the explanatory power and validity of regression analysis is limited and following studies evaluating this set of measurements have to respect further potentially influencing factors.

In conclusion, screening for palliative care need using self-assessment and the modified external screening instrument seems to be feasible in patients with chronic heart failure. Both perspectives, of the patients and their professional caregivers, have to be respected to reveal a comprehensive view the patients' palliative care need. The minimal set of self-assessment using the MIDOS questionnaire plus the modified Palliative Care Screening Tool will be validated in a further study including potential influencing factors. First results indicate significant symptom burden, psychological distress, and palliative care need in patients with chronic heart failure, which will be prospectively evaluated in a larger cohort of patients.

Acknowledgement

We thank all patients and cardiologists for their effort in participating in the present study.

References

- Ostgathe C, Alt-Epping B, Golla H, Gaertner J, Lindena G, et al. (2011) Hospice and palliative care evaluation (hope) working group. Non-cancer patients in specialized palliative care in Germany: What are the problems? *Palliat Med* 25: 148-152.
- O'Leary N, Tiernan E (2008) Survey of specialist palliative care services for noncancer patients in Ireland and perceived barriers. *Palliat Med* 22: 77-83.
- Bekelman DB, Rumsfeld JS, Havranek EP, Yamashita TE, Hutt E, et al. (2009) Symptom burden, depression, and spiritual well-being: A comparison of heart failure and advanced cancer patients. *J Gen Intern Med* 24: 592-598.
- Kavalieratos D, Kamal AH, Abernethy AP, Biddle AK, Carey TS et al. (2014) Comparing unmet needs between community-based palliative care patients with heart failure and patients with cancer. *J Palliat Med* 17: 475-481.
- Gavazzi A, De Maria R, Manzoli L, Bocconcelli P, Di Leonardo A, et al. (2015) A Palliative needs for heart failure or chronic obstructive pulmonary disease: Results of a multicenter observational registry. *Int J Cardiol* 184: 552-558.
- Bekelman DB, Nowels CT, Retrum JH, Allen LA, Shakar S, et al. (2011) Giving voice to patients' and family caregivers' needs in chronic heart failure: implications for palliative care programs. *J Palliat Med* 14: 1317-1324.
- O'Leary N, Murphy NF, O'Loughlin C, Tiernan E, McDonald K (2009) A comparative study of the palliative care needs of heart failure and cancer patients. *Eur J Heart Fail* 11: 406-412.
- Bakitas M, Macmartin M, Trzepkowski K, Robert A, Jackson L, et al. (2013) Palliative care consultations for heart failure patients: How many, when, and why? *J Card Fail* 19: 193-201.
- Daley A, Matthews C, Williams A (2006) Heart failure and palliative care services working in partnership: Report of a new model of care. *Palliat Med* 20: 593-601.
- Evangelista LS, Lombardo D, Malik S, Ballard-Hernandez J, Motie M, et al. (2012) Examining the effects of an outpatient palliative care consultation on symptom burden, depression, and quality of life in patients with symptomatic heart failure. *J Card Fail* 18: 894-899.
- Evangelista LS, Liao S, Motie M, De Michelis N, Ballard-Hernandez J, et al. (2014) Does the type and frequency of palliative care services received by patients with advanced heart failure impact symptom burden? *J Palliat Med* 17: 75-79.
- Schwarz ER, Baraghoush A, Morrissey RP, Shah AB, Shinde AM, et al. (2012) Pilot study of palliative care consultation in patients with advanced heart failure referred for cardiac transplantation. *J Palliat Med* 15: 12-15.
- Greener DT, Quill T, Amir O, Szydowski J, Gramling RE (2014) Palliative care referral among patients hospitalized with advanced heart failure. *J Palliat Med* 17: 1115-1120.
- Gadoud A, Kane E, Macleod U, Ansell P, Oliver S, et al. (2014) Palliative care among heart failure patients in primary care: A comparison to cancer patients using English family practice data. *PLoS One* 9: e113188.
- Ziehm J, Farin E, Seibel K, Becker G, Köberich S (2016) Health care professionals' attitudes regarding palliative care for patients with chronic heart failure: An interview study. *BMC Palliat Care* 15: 76.
- Ziehm J, Farin E, Schäfer J, Woitha K, Becker G, et al. (2016) Palliative care for patients with heart failure: facilitators and barriers - A cross sectional survey of German health care professionals. *BMC Health Serv Res* 16: 361.
- Kavalieratos D, Mitchell EM, Carey TS, Dev S, Biddle AK, et al. (2014) "Not the 'grim reaper service'": An assessment of provider knowledge, attitudes, and perceptions regarding palliative care referral barriers in heart failure. *J Am Heart Assoc* 3: e000544.
- Brännström M, Forssell A, Pettersson B (2011) Physicians' experiences of palliative care for heart failure patients. *Eur J Cardiovasc Nurs* 10: 64-69.
- Cheang MH, Rose G, Cheung CC, Thomas M (2015) Current challenges in palliative care provision for heart failure in the UK: A survey on the perspectives of palliative care professionals. *Open Heart* 2: e000188.
- Metzger M, Norton SA, Quinn JR, Gramling R (2013) Patient and family members' perceptions of palliative care in heart failure. *Heart Lung* 42: 112-119.
- Waller A, Girgis A, Davidson PM, Newton PJ, Lecathelinais C, et al. (2013) Facilitating needs-based support and palliative care for people with chronic heart failure: preliminary evidence for the acceptability, inter-rater reliability, and validity of a needs assessment tool. *J Pain Symptom Manage* 45: 912-925.
- Fasolino T, Phillips M (2016) Utilizing risk readmission assessment tool for nonhospice palliative care consults in heart failure patients. *J Palliat Med* 19: 1098-1101.
- Flint KM, Schmiede SJ, Allen LA, Fendler TJ, Rumsfeld J, et al. (2017) Health status trajectories among outpatients with heart failure. *J Pain Symptom Manage* 53: 224-231.

24. Stiel S, Matthes ME, Bertram L, Ostgathe C, Elsner F, et al. (2010) Validation of the new version of the minimal documentation system (MIDOS) for patients in palliative care: The German version of the edmonton symptom assessment scale (ESAS). *Schmerz* 24: 596-604.
25. Mehnert A, Mueller D, Lehmann C, Koch U (2006) The German version Of the NCCN 'Lstress-Hermometer. Empirical examination of a screening instruments for the detection of psychosocial stress Cancer patients. *ZPPP* 54: 213-223.
26. Kroenke K, Spitzer RL, Williams JB, Löwe B (2009) An ultra-brief screening scale for anxiety and depression: The PHQ-4. *Psychosomatics* 50: 613-621.
27. Glare PA, Semple D, Stabler SM, Saltz LB (2011) Palliative care in the outpatient oncology setting: Evaluation of a practical set of referral criteria. *J Oncol Pract* 7: 366-370.
28. Roth AJ, Kornblith AB, Batel-Cooper L, Peabody E, Scher HI, et al. (1998) Rapid screening for psychologic distress in men with prostate carcinoma. *Cancer* 82:1904-1908.
29. Löwe B, Wahl I, Rose M, Spitzer C, Glaesmer H, et al. (2010) A 4-item measure of depression and anxiety: validation and standardization of the Patient Health Questionnaire-4 (PHQ-4) in the general population. *J Affect Disord* 122: 86-95.
30. Bruera E, Kuehn N, Miller MJ, Selmser P, Macmillan K (1991) The Edmonton Symptom Assessment System (ESAS): A simple method for the assessment of palliative care patients. *J Palliat Care* 7: 6-9.
31. Löwe B, Kroenke K, Herzog W, Gräfe K (2004) Measuring depression outcome with a brief self-report instrument: Sensitivity to change of the Patient Health Questionnaire (PHQ-9). *J Affect Disord* 81: 61-66.
32. Spitzer RL, Kroenke K, Williams JBW, Löwe B (2006) A brief measure for assessing generalized anxiety disorder: The GAD-7. *Arch Intern Med* 166: 1092-1097.
33. Glare PA, Chow K (2015) Validation of a simple screening tool for identifying unmet palliative care needs in patients with cancer. *J Oncol Pract* 11: e81-6
34. Cohen J (1988) *Statistical power analysis for the behavior science*. Lawrence Erlbaum Association.
35. Nunnally JC (1967) *Psychometric Theory*. (2nd edn.), McGraw Hill, Newyork.
36. Ezekowitz JA, Thai V, Hodnefield TS, Sanderson L, Cujec B (2011) The correlation of standard heart failure assessment and palliative care questionnaires in a multidisciplinary heart failure clinic. *J Pain Symptom Manage* 42: 379-387.