

Assessment and Evaluation of Psychosocial Distress in Outpatients with Cancer at a University Hospital in Germany

Laura Hohmann^a Kirsten Merx^a Simone Weingärtner^a Annette Schreiber^a
Svetlana Hetjens^b Wolf-Karsten Hofmann^a Ralf-Dieter Hofheinz^a
Deniz Gencer^a

^a3rd Department of Medicine, Medical Faculty Mannheim, University Medical Center Mannheim, Heidelberg University, Mannheim, Germany; ^bDepartment of Medical Statistics, Biomathematics and Information Processing, University Medical Center Mannheim, Heidelberg University, Heidelberg, Germany

Keywords

Psycho-oncological needs · Psychosocial distress · Cancer patients

Abstract

Introduction: Cancer patients (pts) suffer from a significant amount of psychosocial distress related to tumor disease itself or straining treatments. Despite recommendations on how to screen for and to deal with psychosocial distress in cancer pts, data about implementation of psycho-oncological interventions (poi) in outpatient settings of cancer pts are scarce. The aim of this study was to identify outpatients with cancer in need of poi and to evaluate different assessment instruments. **Methods:** $N = 200$ outpatients with hemat-/oncological malignancies were interviewed between October 2015 and December 2017 at the University Hospital Mannheim using the Basic Documentation for Psycho-Oncology (PO-Bado) and the Hornheider Screening Instrument (HSI) – both clinician-administered assessment tools – followed by descriptive, univariate, and agreement analysis. **Results:** $N = 61$ cancer pts (31%) were identified to be in need for poi considering the results of both questionnaires. The number of identified pts in need of poi was lower when analyzing the results of the PO-Bado ($n = 42$, 21%) and the HSI ($n = 39$, 20%) separately. The degree of agreement between the results of PO-Bado and HSI was low ($\kappa = 0.3655$). Several factors like gender,

age and diagnosis were identified to have significant impact on the need for poi ($p \leq 0.05$). **Conclusion:** Our study underlines that different screening instruments for psychosocial distress may identify disparate populations of cancer pts. The study data also revealed significant characteristics that might be associated with elevated levels of psychosocial distress and a clear indication for poi. However, further analyses on larger populations of cancer pts are needed to provide information how to transfer positive screening to poi in clinical routine.

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Introduction

A number of studies show that cancer patients (pts) suffer from a significant amount of psychosocial distress. The prevalence of psychosocial distress among cancer pts varies from 20 up to almost 50% and sometimes goes on long after successful cancer treatment [1–3]. It is assumed that the following time points in the course of the disease are of particular importance: diagnosis, completion of primary therapy (and the associated hope for a long therapeutic success), occurrence of a relapse or progression of the disease, and the terminal phase of the disease [4]. In recent years, psycho-oncology has gained importance and has become an indispensable component of holistic, patient-centered treatment in contemporary cancer medicine [5]. The German S3 Guideline for psycho-oncology

recommends the assessment of psychosocial distress and the individual need for psycho-oncological intervention (poi) in all cancer patients [6]. Therefore, five screening instruments are recommended by the Working Group for Psycho-Oncology of the German Cancer Society (PSO): the Hospital Anxiety and Depression Scale (HADS), the Distress Thermometer (DT), the FKB-23, the Hornheider Screening Instrument (HSI), and the Basic Documentation for Psycho-Oncology (PO-Bado) [7]. Published data reporting on screening for psychosocial distress in cancer pts are difficult to compare due to various patient collectives. Furthermore, different instruments are used and some of them are not even specific for cancer pts. Especially in an outpatient setting, information about psychological distress and need for poi is unsatisfactory [8–12].

Primary objective of this study was to evaluate the need for poi of outpatient cancer pts treated at the outpatient department of the Mannheim Cancer Center at the University Hospital Mannheim using two German standard psycho-oncological screening instruments. Moreover, we were interested in evaluating the percentage of pts identified with both instruments and to gain insight if both should be used complementary as there has not been performed a head-to-head comparison of both instruments, yet. In addition, this study sought to identify predictive factors for psychosocial distress in cancer pts.

Methods

Design and Procedure

Cancer pts in an outpatient setting were eligible for an interview by a trained clinical scientist and under supervision of a senior physician between October 2015 and December 2017. The recruitment period of more than 2 years is explained by fixed, limited daily time slots for the conduction of the interviews and the cross-sectional design. Pts with a minimal age of 18 years suffering from different hemato-/oncological diseases without known mental disorders or language restrictions were asked to participate in the study. Participation was voluntary and took place after written informed consent. The interviews mostly took place prior to the doctor's appointments or during waiting time for their cancer treatment. The interviews were conducted in specially assigned rooms to ensure privacy and a peaceful atmosphere. The study was approved by the Local Ethics Committee (2015-627N-MA).

Assessment Instruments and Data Collection

Psycho-oncological needs were assessed by means of a personal interview using the PO-Bado and the HSI complementary and always in the same order (for detailed information about the two instruments see online suppl. material S1, S2; for all online suppl. material, see <https://doi.org/10.1159/000531888>). Both, the PO-Bado and the HSI are recommended by the PSO as equivalent screening instruments for psychosocial distress in cancer pts. Both tools show good practical feasibility, a brevity of the assessments and psychometric reliability [7].

The HSI was developed to determine the need for psycho-oncological care in pts with oncological diseases of various entities, stages, and types of treatment. It is available as an interview- or questionnaire version and is a self-assessment instrument that does not allow any interpretation on the part of the interviewer. Due to the short processing time (approximately 1 min), it is also suitable as a screening instrument during the initial medical interview [7]. The HSI interview version comprises a total of 7 items on physical and mental well-being, on disease-independent stress, on the presence of confidants, on the stress on the family, on the presence of inner (in) calm, and on the patient's disease-related information. It is a valid and reliable self-assessment tool [7].

The PO-Bado was developed in the form of a structured interview with the aim of recording the subjective stress in relation to the last 3 days. This allows to recognize a need for psycho-oncological care even below the psychiatric symptom threshold [13]. Pts who, for physical or psychological reasons, are not able to complete a questionnaire on their own can also be interviewed [14]. In addition to verbal aspects, nonverbal (conscious and unconscious) aspects can also be recorded. The PO-Bado focuses on sociodemographic and medical data as well as different areas of somatic and psychological stress (17 items).

Statistical Analysis

The statistical analysis included descriptive evaluations on the sociodemographic and medical data and the answers from the questionnaires. Quantitative parameters are presented by mean and range is given. Qualitative data are described by their absolute and relative frequencies. To test the influence of sociodemographic and medical variables on the screening results, standard statistical tests were used with significance level of $p \leq 0.05$. Qualitative data are described by their absolute and relative frequencies.

In order to compare qualitative parameters, a χ^2 test or Fisher's exact test was used, where appropriate. The mean values of two groups were compared by two-sample t tests (in the case of normally distributed data) or the Mann-Whitney U-test. To test the accordance between both questionnaires, the kappa coefficient was calculated. A value >0.6 indicates good, a value >0.8 excellent agreement [15]. All analyses were performed using the SAS statistical analysis software (release 9.4; Cary, NC, USA).

Results

Patients' Characteristics

a) Response and termination rates

Of $n = 250$ screened pts, $n = 202$ (81%) gave their informed consent and participated in the study. Two interviews had to be terminated prematurely as requested by the pts resulting in a final dataset of $n = 200$.

b) Sociodemographic data

Mean age of the $n = 200$ participating cancer pts was 63.2 years (range 31–89). $N = 120$ were female (60%). At the time of this study, $n = 157$ pts (79%) have been living in a permanent relationship. A total of $n = 164$ pts (82%) had at least one child. Most of the pts were retired ($n = 127$, 64%), $n = 41$ (21%) were incapable of working for medical reasons, $n = 20$ (10%) were still working in a job (Table 1).

Table 1. Sociodemographic and medical patient data

	Male		Female		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
	80	40	120	60	200	100
Age						
Mean (SD)	66.1		61.3		63.2	
	(9.22)		(11.55)		(10.90)	
Range	37–86		31–89		31–89	
Age groups						
1 (≤ 49)	3	3.8	21	18	24	12
2 (50–64)	27	34	56	47	83	42
3 (≥ 65)	50	63	43	36	93	47
Stable partnership						
Yes	73	91	84	70	157	79
No	7	8.8	36	30	43	22
Children						
Yes	66	83	98	82	164	82
No	14	18	22	18	36	18
Occupation						
Employed	10	13	10	8.3	20	10
Sick leave	10	13	31	26	41	21
Retired	58	73	69	58	127	64
Others	2	2.5	10	8.3	12	6.0
Diagnosis						
Hematological	20	25	26	22	46	23
Colorectal cancer	28	35	13	11	41	21
Lung cancer	7	8.8	13	11	20	10
Gastrointestinal cancer	10	13	5	4.2	15	7.5
Pancreatic cancer	4	5.0	7	5.8	11	5.5
Others	11	14	3	2.5	14	7.0
Breast cancer	0	0	42	35	42	21
Gynecological cancer (without breast cancer)	0	0	11	9.2	11	5.5
Metastasis						
Yes	48	60	66	55	114	57
No	12	15	26	22	38	19
N/a	20	25	28	23	48	24
Medical condition						
Active disease	75	94	116	97	191	96
Remission	5	6.3	4	3.3	9	4.5
Treatment						
Chemotherapy	58	73	81	68	139	70
Radiation	2	2.5	12	10	14	7.0
Hormone therapy	0	0	5	4.2	5	2.5
Others	21	26	40	33	61	31
Medication						
Painkillers	8	10	21	18	29	15
Sedatives	3	3.8	13	11	16	8.0
Sleeping pills	3	3.8	9	7.5	12	6.0
Prior psychological/psychiatric treatment						
Yes	7	8.8	46	38	53	27
No	73	91	74	62	147	74
Therapeutic objective						
Curation	14	18	26	22	40	20
Palliation	66	83	93	78	159	80
N/a	0	0	1	0.8	1	0.5
ECOG						
0	26	33	43	36	69	35
1	35	44	38	32	73	37
2	19	24	38	32	57	29
3	0	0	1	0.8	1	0.5
4	0	0	0	0	0	0

SD, standard deviation; ECOG, Eastern Co-operative of Oncology Group.

c) Medical data

$N = 159$ pts (80%) had non-curable disease and received palliative treatment. Most of the cancer pts received chemotherapy ($n = 139$, 70%), other systemic treatments like immunotherapy or antibodies ($n = 61$, 31%), hormone therapy ($n = 5$, 2.5%), or combinations. Most pts had either no or slight restrictions in daily activities (ECOG 0 or 1, $n = 142$, 71%), while $n = 57$ pts (29%) had ECOG 2 (Table 1).

Screening Results for Psychosocial Distress

Considering the results of both the PO-Bado and the HSI, a total of $n = 61$ pts (31%) were identified to be in need for poi. $N = 46$ of the 61 identified pts (75%) were female; mean age was 60.5 years (range 31–80 years). About one-third of the pts with psychosocial distress had breast cancer ($n = 20$, 33%). $N = 40$ (66%) had metastatic cancer, palliation was known as therapeutic aim in $n = 47$ pts (77%) of the identified cancer pts. The proportion of pts with ECOG ≥ 2 was higher in the group with need for psycho-oncological treatment ($n = 30$, 49%) than in the group without need ($n = 28$, 20%).

Notably, the number of identified pts in need of poi was lower when analyzing the results of the PO-Bado and the HSI separately. The particular results of both instruments implied need for poi in $n = 42$ (21%) for PO-Bado and $n = 39$ (20%) for HSI.

Based on the results of the PO-Bado, a slightly higher count of female pts was found to be in need of poi ($n = 32$, 76%) with similar mean age (59.1, range 37–80 years) and distribution of diagnoses compared to the combined results of both instruments. In contrast, the HSI identified a quite lower account of female cancer pts ($n = 28$, 72%) with noticeable higher amount of metastatic disease ($n = 28$, 72%) or palliation as treatment objective ($n = 32$, 82%). However, none of these described numeric differences were statistically significant (Table 2).

Agreement of Both Assessment Instruments

In the agreement analysis, a low to moderate agreement of the results of PO-Bado and HSI could be detected with kappa = 0.3655 (Fig. 1). In addition, we sought to characterize the small collective of cancer pts that were identified by both instruments ($n = 20$). These pts tended to be a bit younger (mean age 58.8, range 37–77 years, SD 11.13) with a lower proportion of female pts ($n = 12$, 60%) and more often with a performance status of ECOG ≥ 2 ($n = 11$, 55%).

Potential Predicting Factors for Positive Screening Results

For further evaluation and characterization of the identified cancer pts, a univariate analysis was conducted. Several factors were identified to have significant impact on the need for poi (Table 3).

a) Gender

Considering the combined screening results of both instruments, a noticeably significant influence of gender on positive screening results could be found. Women were significantly more often screened positive ($p = 0.003$). This was also reflected in the separate evaluation of the PO-Bado ($p = 0.016$) but could not be confirmed in the analysis of the HSI ($p = 0.094$).

b) Age

Using defined age groups (1: ≤ 49 years, 2: 50–64 years; 3: ≥ 65 years) [16], a highly significant influence of age on positive screening could be confirmed within the combined analysis of both instruments as well as for the results of the PO-Bado alone. In age group 1, the proportion of positive screenings was significantly higher than in the other age groups ($p = 0.006$ and $p = 0.006$, respectively). There was also a trend for a dropping need for poi with increasing age. The separate analysis of the HSI did not reflect any significant age-dependent influence ($p = 0.127$).

c) Diagnosis

Within the overall evaluation of both instruments, a weak significant influence of the diagnosis was confirmed. Pts with breast cancer significantly more often were identified to be in need for poi than pts with other cancer diagnosis ($p = 0.023$). The separate analyses of the PO-Bado and the HSI did not show this significance regarding tumor diagnosis.

d) Performance status

In the combined analysis of both screening instruments as well as in the separate evaluations of the PO-Bado and the HSI, the proportion of positive identified cancer pts increased with worse WHO performance status ($p < 0.001$, $p = 0.003$, and $p = 0.002$, respectively).

e) Somatic symptoms

A highly significant influence of somatic symptoms and impairment in daily activities on the screening results could be found in both, the combined and the separate evaluations. The greater the symptom burden, the higher the proportion of pts requiring poi ($p < 0.001$, respectively).

f) Personal relationship

Being in a permanent relationship was revealed to be a significant factor for less psychosocial distress. This could be shown within the combined analysis and the separate evaluation of the PO-Bado but not for the HSI ($p = 0.003$, $p < 0.001$, and $p = 0.256$, respectively).

Discussion

The current study sought to identify cancer pts with need for poi in an outpatient setting using two well-established and validated screening instruments in Germany. We chose these two instruments due to the rapid processing time and for being detached from any psychologic diagnosis criteria – in contrast to HADS or

Table 2. Sociodemographic and medical patient data dependent on poi needs

	Poi needs		No poi needs		Poi needs (HSI)		No poi needs (HSI)		Poi needs (PO-Bado)		No poi needs (PO-Bado)	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
	61	31	139	70	39	20	161	81	42	21	158	79
Gender												
Female	46	75	74	53	28	72	92	57	32	76	88	56
Male	15	25	65	47	11	28	69	43	10	24	70	44
age												
Mean (SD)	60.5 (12.69)		64.4 (9.85)		61.1 (13.16)		63.7 (10.28)		59.1 (12.12)		64.3 (10.35)	
Range	31–80		40–89		31–80		37–89		37–80		31–89	
Age groups												
1 (≤ 49)	13	21	11	7.9	8	21	16	10	10	24	14	8.9
2 (50–64)	28	46	55	40	17	44	66	41	20	48	63	40
3 (≥ 65)	20	33	73	53	14	36	79	49	12	29	81	51
Relationship												
Yes	40	66	117	84	28	72	129	80	25	60	132	84
No	21	34	22	16	11	28	32	20	17	40	26	16
Children												
Yes	49	80	115	83	31	79	133	83	34	81	130	82
No	12	20	24	17	8	21	28	17	8	19	28	18
Occupation												
Employed	6	10	14	10	4	10	16	10	4	10	16	10
Sick leave	16	26	25	18	7	18	34	21	12	29	29	18
Retired	33	54	94	68	24	62	103	64	20	48	107	68
Others	6	10	6	4.3	4	10	8	5.0	6	14	6	3.8
Diagnosis												
Breast cancer	20	33	22	16	13	33	29	18	14	33	28	18
Haemato-logical	9	15	37	27	6	15	40	25	5	12	41	26
Colorectal cancer	9	15	32	23	6	15	35	22	7	17	34	22
Lung cancer	8	13	12	8.6	3	7.7	17	11	6	14	14	8.9
Gynecological cancer (without breast cancer)	6	10	5	3.6	5	13	6	3.7	4	10	7	4.4
Pancreatic cancer	4	6.6	7	5.0	3	7.7	8	5.0	2	4.8	9	5.7
Gastrointestinal cancer	3	4.9	12	8.6	2	5.1	13	8.1	2	4.8	13	8.2
Others	2	3.3	12	8.6	1	2.6	13	8.1	2	4.8	12	7.6
Metastasis												
Yes	40	66	74	53	28	72	86	53	26	62	88	56
No	13	21	25	18	6	15	32	20	11	26	27	17
N/a	8	13	40	29	5	13	43	27	5	12	43	27
Medical condition												
Active disease	58	95	133	96	36	92	155	96	40	95	151	96
Remission	3	4.9	6	4.3	3	7.7	6	3.7	2	4.8	7	4.4
Therapeutic objective												
Curation	14	23	26	19	7	18	33	21	12	29	28	18
Palliation	47	77	112	81	32	82	127	79	30	71	129	82
N/a	0	0	1	0.7	0	0	1	0.6	0	0	1	0.6
ECOG												
0	12	20	57	41	6	15	63	39	9	21	60	38
1	19	31	54	39	13	33	60	37	12	29	61	39
2	29	48	28	20	20	51	37	23	20	48	37	23
3	1	1.6	0	0	0	0	1	0.6	1	2.4	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0

poi, psycho-oncological intervention; HSI, Hornheider Screening Instrument; PO-Bado, Basic Documentation for Psycho-Oncology.

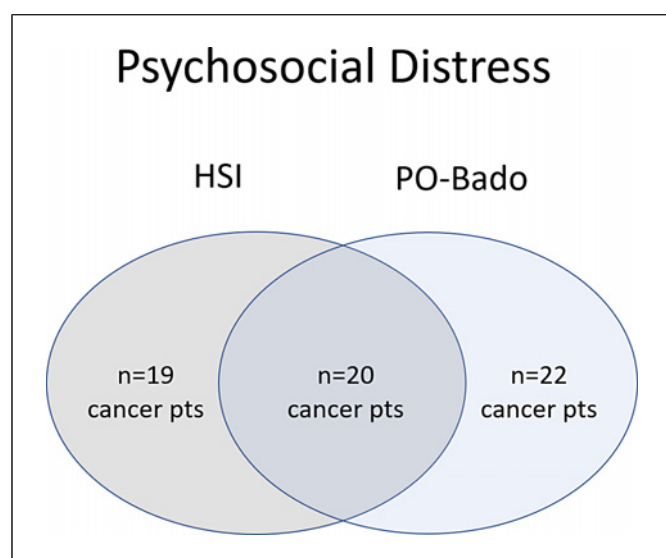


Fig. 1. Concordance of the screening results of PO-Bado and HSI. HSI, Hornheider Screening Instrument; PO-Bado, Basic Documentation for Psycho-Oncology; pts, patients.

DSM-IV. Overall analysis of our study data revealed need for poi in 31% of all pts. In the first instance, this finding goes in line with published data on the subject of psycho-oncological needs in cancer pts [17–21]. However, in the separate analyzes of PO-Bado and HSI in the current study, less pts were identified (21 and 20%, respectively). Focusing on prior studies for each instrument might help find possible explanations for this discrepancy. Studies objecting the PO-Bado as a screening instrument for psychosocial distress in cancer pts showed quite heterogeneous results. The necessity for poi differed from 23% up to 41% [17, 22, 23]. The significance of the so far published data investigating the use of HSI as a screening instrument also remains unclear, as the identified pts vary from 32 to 42% [18, 19, 24]. Most of these studies were conducted within inpatient hospital settings, which could have influenced the results in terms of the interview timing, atmosphere or the spatial conditions and therefore might explain the higher screening rates compared to our current study. As found in our analysis, cancer pts with higher symptom burden also have more need for poi. It is likely that the aforementioned higher screening rates for inpatients reflect the higher number of tumor-related symptoms that might have led to their admission.

Based on the recommendations by the PSO to use PO-Bado or HSI as equivalent screening tools for psychosocial distress in cancer pts, both were chosen for our current analysis complementarily. Unexpectedly, further analysis revealed only poor to moderate agreement of the identified populations ($\kappa = 0.3655$). Although the two instruments each identified about 20% of the pts to be in need for poi, only 33% of all positively screened cancer pts were identified by both instruments. The dissimilar assessment

approaches of the two instruments could be a possible explanation for this finding. The HSI can be used for self-assessment as well as for assessment by others like clinical staff and has very limited options for (mis)interpretation.

In contrast, the PO-Bado, as an interview-guided instrument, leaves more space for interpretation or evaluation of the given answers depending on the perceptions of the interviewer. On the one hand, the ability to perform a sensitive and empathetic interview and to perceive non-verbal signs for psychosocial distress could lead to identification of more pts that might benefit from poi. On the other hand, unexperienced interviewers could miss non-verbal and unconscious communication, which would result in too many false-negative screenings. This interviewer-dependent influence on screening results underlines the general difficulty of different assessment methods and external estimation in terms of psychosocial distress. For example, Keller et al. compared self-assessment using HADS with a structured clinical interview for DSM-IV (SKID) and external assessment by physicians and nurses to detect need for psychosocial support in cancer pts. Some of the cancer pts with DSM-IV diagnosis or high values through HADS were not identified to be in need for psychosocial support by the medical staff. In contrast, cancer pts with no DSM-IV diagnosis or lower values through HADS in some cases were recommended for psychosocial support. The agreement between physicians' and nurses' perceptions and the DSM-IV/HADS screening results was poor. Notably, physicians referred less than half of cancer pts with DSM-IV diagnosis and only one-third of cancer pts with HADS high scores to psychosocial liaison service [25]. These findings might implicate that self-assessment could be a better choice to identify cancer pts with need for poi. Nevertheless, even when paper-pencil forms are used, pts could still be tempted to give answers that are socially tolerated instead of filling out the questionnaire honestly based on their feelings and emotions. Some authors state that ongoing stigmatization related to tumor diseases and psychological illness may deceive pts to conceal their psychologic problems and not to use psychological support in order to be socially accepted [20, 26].

Within the 31% of the cancer pts that might need poi in the current study, a significant high count were female, of younger age, with the diagnosis breast cancer, in rather restricted performance status, had higher somatic symptom burden – which alone might influence the psychological distress level extensively [19, 20] – and were less often living in a permanent relationship. Some of these criteria are confirmed by the results of a large German study published in 2016 [27]. Using three different assessment instruments for evaluation of psychosocial distress in 4,020 cancer pts, Faller et al. identified 32% of the pts to be in need of support. Like in our study, female sex, young age and missing personal relationship were identified as

Table 3. Significant factors for poi needs based on the results of both, the PO-Bado and HSI

Category	Poi need		No poi need		χ^2	p (χ^2 /Fisher)
	N	%	N	%		
Gender						
Female (n = 120)	46	38	74	62	8.6842	0.0032
Male (n = 80)	15	19	65	81		
Age						
Age group 1 (n = 24)	13	54	11	46	10.301	0.0058
Age group 2 (n = 83)	28	34	55	66		
Age group 3 (n = 93)	20	22	73	78		
Diagnosis						
Breast cancer (n = 42)	20	48	22	52	16.362	0.0229
Hematological (n = 46)	9	20	37	80		
Colorectal cancer (n = 41)	9	22	32	78		
Lung cancer (n = 20)	8	40	12	60		
Gynecological cancer (without breast cancer) (n = 11)	6	55	5	45		
Pancreatic cancer (n = 11)	4	36	7	64		
Gastrointestinal cancer (n = 15)	3	20	12	80		
Others (n = 14)	2	14	12	86		
Tumor stage						
Metastasis (n = 114)	40	35	74	65	5.7119	0.0575
No metastasis (n = 38)	13	34	25	66		
N/A (n = 48)	8	17	40	83		
Therapeutic objective						
Palliation (n = 159)	47	30	112	70	0.445	0.5047
Curation (n = 40)	14	35	26	65		
Performance status						
ECOG 0 (n = 69)	12	17	57	83	19.727	0.0001
ECOG 1 (n = 73)	19	26	54	74		
ECOG 2 (n = 57)	29	51	28	49		
ECOG 3 (n = 1)	1	100	0	0		
Fatigue						
No stress n = 103)	14	14	89	86	58.258	<0.0001
Low stress level (n = 78)	28	36	50	64		
High stress level (n = 19)	19	100	0	0		
Pain						
No stress (n = 141)	24	17	117	83	49.833	<0.0001
Low stress level (n = 48)	26	54	22	46		
High stress level (n = 11)	11	100	0	0		
Daily life restrictions						
No stress (n = 103)	15	15	88	85	43.055	<0.0001
Low stress level (n = 74)	27	36	47	64		
High stress level (n = 23)	19	83	4	17		
Relationship						
Relationship (n = 157)	40	25	117	75	8.6892	0.0032
No relationship (n = 43)	21	49	22	51		

poi, psycho-oncological intervention; HSI, Hornheider Screening Instrument; PO-Bado, Basic Documentation for Psycho-Oncology.

significant factors regarding need for psychosocial support. Nevertheless, 26% of the cancer pts with lower distress levels also wished for psychosocial support. Based on these results and the findings of our study, the threshold to screen young and female cancer pts for psychosocial distress shortly after being diagnosed with cancer should be extremely low going in line with clinical practice guidelines.

Finally, it stays unanswered how psychosocial or psycho-oncological support might look like. The German S3 Guideline for psycho-oncology defines a poi as a non-pharmacological intervention in which psychological and social methods, such as psychosocial counseling, psycho-education, stress management training, psychotherapy, and relaxation methods, alone or in combination, are conducted by a professional therapist in a face-to-face interaction with

cancer pts, in order to reduce their psychological burden and increase their quality of life [6, 28]. Only therapists will be able to decide, how long such interventions might be necessary along with or beyond cancer therapy.

However, the rather small collective of cancer pts of our current study and the heterogeneous pts' characteristics might be limitations when interpreting the study results. In addition, interviewer-dependent effects on the study results cannot be excluded, as the two assessment instruments both were provided in interview form. Furthermore, due to the small and heterogenous patient cohort no multivariable logistic regression analysis using clinical distress as an outcome parameter was performed which could have helped to identify other relevant independent factors for psycho-oncological support. The outpatient setting certainly is highly relevant to address a high number of cancer pts but has to deal with several challenges like interview atmosphere and spatial conditions.

Conclusion

In our study, two different assessment tools identified disparate populations of cancer pts to be in need for poi – a finding that was rather unexpected. Especially in outpatient settings, the choice of the right screening instrument and method might be important and the question remains if screening alone is sufficient enough to identify all cancer pts in need. Finally, our study data revealed significant characteristics (e.g., female, young) that might be associated with elevated levels of psychosocial distress and a clear indication for poi, even without positive screening. Larger multicenter analyses are warranted to corroborate the data presented herein in order to provide more information how best to implement poi in clinical routine.

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Statement of Ethics

This study was conducted according to the principles of the Declaration of Helsinki and was approved by the Local Ethical Committee, Medical Ethics Commission II, Faculty of Medicine Mannheim, University of Heidelberg, Germany (2015-627N-MA). Written informed consent was obtained from all pts.

Conflict of Interest Statement

Prof. Ralf-Dieter Hofheinz is a member of the Editorial Board of *Oncology Research and Treatment*. Apart from that, no other conflicts of interest are to be disclosed.

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Author Contributions

Laura Hohmann and Prof. Ralf-Dieter Hofheinz conceived the study. Laura Hohmann performed the examinations and the data collection. Data were further processed by Laura Hohmann and PD Dr. Deniz Gencer to be statistically analyzed by Dr. Svetlana Hetjens. Dr. Kirsten Merx and Dr. Simone Weingaertner helped identify eligible pts and supported recruitment and study enrollment. Laura Hohmann and PD Dr. Deniz Gencer prepared the initial manuscript draft with essential scientific input of Annette Schreiber, Prof. Wolf-Karsten Hofmann, and Prof. Ralf-Dieter Hofheinz. All authors approved the final version.

Data Availability Statement

All data generated or analyzed during this study are included in this article. Further inquiries can be directed to the corresponding author.

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