Research Square

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Identification of high-impact chronic pain among cancer survivors: a cross-sectional study using the Graded Chronic Pain Scale framework

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Abstract

Purpose

Chronic cancer-related pain is a prevalent and often under-recognised issue among individuals living with or after cancer. Clinically useful tools are needed to classify pain severity and impact and to identify those requiring targeted support. This study applied the Graded Chronic Pain Scale–Revised (GCPS-R) in a cohort of cancer survivors and examined differences in pain characteristics and psychosocial factors across GCPS-R subgroups. Secondly, the study compared pain characteristics in cancer survivors with high-impact chronic pain (HICP) to an age- and sex-matched sample of patients with non-cancer HICP.

Methods

Patients attending a residential cancer rehabilitation programme completed a screening questionnaire and a pain-specific module including the GCPS-R and validated measures of disability, psychological distress, pain catastrophizing, and self-rated health. Cancer survivors with HICP were matched 1:3 to non-cancer patients with HICP from an interdisciplinary pain center. Group differences were analysed using ANOVA and t-tests with effect sizes.

Results

Among 270 cancer survivors included in the analysis, 61% were classified as having HICP. Increasing GCPS-R impact levels were associated with greater pain intensity and disability, higher psychological distress and pain catastrophizing, and poorer self-rated health and quality of life ($p < 0.05$). Compared with matched non-cancer patients with HICP, cancer survivors reported lower pain intensity and catastrophizing but were at least as likely to meet criteria for widespread pain.

Conclusion

HICP is common among cancer survivors seeking rehabilitation. The GCPS-R differentiated clinically meaningful subgroups and may support systematic assessment of pain severity and impact to identify patients requiring targeted support.

Introduction

Chronic cancer-related pain can appear as a consequence of cancer or its treatment [1]. Practitioners may not be aware of this consequence [2], resulting in pain being inadequately addressed [3]. In a study of patients attending routine follow-up in oncology clinics, Perez et al. found that 47% of patients who had survived cancer for five years or more reported chronic pain [4]. Bouhassira et al. [5] similarly reported a chronic pain prevalence of 28% among 1,805 patients visiting French outpatient oncology units. In the 'National Health Interview Survey' (NHIS), among adults living in US, chronic pain was reported by 31% of cancer survivors compared to 16% of individuals without a cancer history [6], highlighting the long-term burden of pain following cancer.

The consequences associated with chronic cancer-related pain are likely influenced by its severity and impact on daily life [7]. For optimal pain treatment, it is important to recognize differences in pain severity and impact. Routine assessment of pain characteristics among patients with chronic cancer-related pain is not common practice and there is a need for systematic classification frameworks that can support clinical decision-making of pain treatment strategies, e.g. identification of patients with high-impact chronic pain, who may need interdisciplinary multimodal pain therapy [3]. The presence of high-impact chronic cancer-related pain is supported by a US-based survey, including 4,526 adult cancer survivors, where 36% reported chronic pain, and of those, 46% were categorised with high-impact chronic pain [8].

Focus on high-impact chronic pain (HICP) has recently become more common in the non-cancer pain literature. HICP is defined as pain for at least 3 months that has substantial impact on activities of daily living [7]. The Graded Chronic Pain Scale–Revised (GCPS-R) is a tool developed to support clinically meaningful classification of chronic non-cancer pain into mild, bothersome, or high-impact chronic pain [7, 9] by capturing core domains of pain severity and impact with minimal respondent burden [7]. It has been validated using large population-based datasets. However, the utility of GCPS-R in cancer populations remains poorly unexplored.

In REHPA, Knowledge Centre for Rehabilitation and Palliative Care, rehabilitation courses are offered to cancer survivors, either living with or after cancer. According to Patient Reported Outcome data routinely collected prior to the patients' participation in the courses, pain was reported by 68% of included patients. In the present study, cancer survivors participating in REHPA's rehabilitation programmes from March 2022 to February 2025 were invited to fill a questionnaire about pain problems, if they reported to live with pain prior to attending the programme. Based on their responses, the GCPS-R framework was applied to identify clinically relevant pain subgroups, among patients living with cancer-related pain.

Aims

The primary aim of this study was to explore differences in pain characteristics and psychosocial factors across mild, bothersome and high impact chronic cancer-related pain subgroups. The secondary aim was to compare pain characteristics and psychosocial profiles between cancer survivors with HICP and a reference sample of patients with non-cancer HICP treated in an interdisciplinary Pain Center.

Materials and methods

Study Design and Patients

This cross-sectional study included patients with cancer-related pain who attended one of the cancer-related rehabilitation programmes offered by the Danish Knowledge Centre for Rehabilitation and Palliative Care (REHPA), from March 2022 to February 2025. Patients who live with or after cancer can apply for one of REHPA's structured rehabilitation programs, which includes an initial residential stay followed by a period at home and subsequently finalizing the course with a follow-up stay. The patients were adults (≥18 years), self-reliant and considered able to participate in the programme. In this study, 'cancer survivors' refer to patients eligible for REHPA's rehabilitation programme. The patients apply for the courses usually because of disease symptoms and/or treatment-related late-effects in their daily lives. Patients unable to complete the questionnaires due to language barriers or cognitive impairments were excluded from the study.

Data Collection

Data were collected from patients who reported pain in an initial screening questionnaire (Q), which was distributed 2–3 weeks prior to attending the rehabilitation programme. The initial screening Q consisted of a collection of validated instruments covering various domains, including health-related quality of life, psychological distress, fatigue, sleep quality, pain intensity, and sociodemographic characteristics [10].

Based on responses to the screening Q, patients meeting predefined pain criteria were identified and informed about the supplementary pain-specific questionnaire ('c-module') during the initial 5-day residential stay at REHPA. Written informed consent for participation in the study was obtained during this stay.

Following the residential stay, eligible patients were invited to complete the 'c-module', which was distributed electronically via a secure link approximately one week after the stay. Eligibility for invitation to the 'c-module' was defined as meeting at least one of the following criteria:

1. Average pain intensity of ³4 on a numeric rating scale over the past 2 days
2. Experiencing pain during the past week ('quite a bit' or 'very much')
3. Pain interfering with daily activities ('quite a bit' or 'very much')
4. Affirmed having pain on a daily, frequent, or occasional basis.

The 'c-module' included a combination of validated instruments and purpose-designed items aimed at capturing pain characteristics, pain-related interference, and body chart data on pain location and distribution. Several components were selected to align with elements from the national PainData Registry for chronic non-cancer pain [11]. This registry contains data from a web-based questionnaire completed by patients prior to their initial consultation at Danish interdisciplinary pain centres treating patients with complex chronic non-cancer pain. This enabled direct comparison between cancer- and non-cancer pain populations.

All data were collected electronically and stored in accordance with data protection regulations.

Measures

Initial screening questionnaire

The initial screening questionnaire included pain-related items assessing pain intensity, pain interference, and pain frequency, which were used to determine eligibility for the supplementary pain-specific questionnaire ('c-module').

Sociodemographic variables included age, sex, civil status, education level, smoking status, alcohol consumption and physical activity level.

Symptoms of depression were assessed using the *Patient Health Questionnaire-9* (PHQ-9). The scale consists of nine items related to core symptoms of depression, each rated on a 4-point Likert scale from 0 = "not at all" to 3 = "nearly every day" yielding a total score ranging from 0 to 27. Higher scores indicate greater depression severity [12]. The PHQ-9 has demonstrated good validity and reliability [13] and is widely used in chronic pain populations [14].

Symptoms of anxiety were assessed using the *Generalized Anxiety Disorder-7* (GAD-7) questionnaire. The GAD-7 comprises seven items rated on a 4-point Likert scale from 0 = "not at all" to 3 = "nearly every day" with a total score ranging from 0 to 21. Higher scores reflect more severe anxiety symptoms [15]. The GAD-7 has also shown good validity and reliability and is commonly applied in studies involving patients with chronic pain [14].

Self-rated health was assessed using the PROMIS Global Health item, which asks patients to rate their general health on a 5-point Likert scale ranging from 1 (poor) to 5 (excellent). This single item has shown acceptable validity as a global measure of perceived health status in clinical and population-based samples [16].

Quality of life was assessed using a single item from the EORTC QLQ-C30, asking patients: *"How would you rate your overall quality of life during the past week?"*. Responses were scored on a 7-point Likert scale ranging from 1 (very poor) to 7 (excellent), with higher scores indicating better quality of life [17].

'The c-module'

The pain-specific 'c-module' included the GCPS-R as well as validated questionnaires and single item screening questions to capture pain impact, pain-related disability, pain-related cognition, and pain distribution.

GCPS-R: The GCPS-R is a brief, self-administered questionnaire comprising six items (Figure 1a). A scoring algorithm combines responses from the first 5 items into a hierarchical classification with three levels of chronic pain severity: mild, bothersome, and high-impact chronic pain (HICP) (Figure 1b) [7].

Figure 1 (a & b) around here

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Widespread pain: Based on patients' pain drawing (Supplementary Figure 1) on a anatomically divided body with 71 regions [11], widespread pain was coded according to the American College of Rheumatology 1990 criteria, defined as pain present on both the left and right sides of the body, above and below the waist, and in the axial skeleton (neck, back, or chest) [18].

Pain-related disability was assessed using the *Pain Disability Index* (PDI), a generic scale that measures the degree to which pain interferes with voluntary daily activities, including family/home responsibilities, recreational activities, social activities, occupational activities, and sexual behaviour [19]. Each of the five items is scored on an 11-point numerical rating scale (0 = "no disability" to 10 = "worst disability"), yielding a total score between 0 and 50. In line with previous psychometric analyses, only the voluntary activity items were used, as the obligatory activity items (self-care and life-support activities) have shown low internal reliability in similar populations [20].

Catastrophic thinking related to pain was assessed using a single item from the *Pain Catastrophizing Scale* (PCS): *"When I am in pain, it's terrible and I think it's never going to get any better."* Responses were scored on a scale from 0 = "never do that" to 10 = "always do that." This item has previously been shown to have good predictive validity for pain-related outcomes and was selected based on its performance in prior studies [21].

Comparison Sample from Interdisciplinary Pain Center

For the secondary aim of the study, data from an age- and sex-matched sample of patients with HICP based on GCPS-R from the interdisciplinary Pain Center, at Odense University Hospital was extracted from the PainData Registry. A stratified random sampling procedure was applied to create a dataset with a 1:3 ratio of cancer- to non-cancer patients, with matching performed without replacement. Based on age and sex, three non-cancer patients were randomly selected for each cancer patient within each of the following 10-year age strata: 18-29, 30-39, 40-49, 50-59, 60-69, 70-79 and 80-89. The cancer- and non-cancer-patient datasets were then combined for analysis, and variables measured in the same way in both cohorts were included in the between-group analyses. These variables were pain drawing, average pain intensity during the past week (NRS 0-10), depression (PHQ-9), anxiety (GAD-7), pain catastrophizing (single item from PCS) and self-rated health (PROMIS Global Health single item).

Statistical Analysis

Descriptive statistics were used to summarize patient characteristics and questionnaire scores. For the primary aim, cancer pain group comparisons between the three GCPS-R categories were conducted using one-way analysis of variance (ANOVA) for continuous variables. If the overall test was statistically significant ($p < 0.05$), pairwise comparisons were performed using Bonferroni post-hoc tests. Only patients with complete data for GCPS-R classification were included in the final analysis. Non-responders to the 'c-module' had their answers from the screening-Q compared with the responders, to explore for potential selection bias.

For the secondary aim, unpaired t-tests and chi^2 were used to compare pain characteristics between patients with cancer-related HICP and non-cancer HICP, and effect-sizes (Cohen's d) were calculated for interpretation. Values of d around 0.2 indicate a small effect, around 0.5 a moderate effect and ³0.8 a large effect [22].

All statistical analyses were conducted using STATA version 15 [StataCorp LLC, College Station, TX, USA23].

Results

Figure 2 illustrates the participant flow.

Of the 877 patients who participated in the cancer rehabilitation programme at REHPA, 375 met the pain criteria for receiving the 'c-module'. Of these, 300 responded. Non-responders were slightly younger and reported marginally lower pain intensity and -interference, as well as lower levels of physical activity, but did not differ substantially from responders on other clinical or demographic variables (see supplementary table 2).

After excluding patients with incomplete questionnaire responses, the final study sample comprised 270 patients, classified into mild (13%), bothersome (26%), and high-impact (61%) chronic pain groups (Table 1). The underlying cancer diagnoses among the 270 patients were; 58% with breast cancer, 9% with gastrointestinal cancer, 9% with haematological cancer, mainly multiple myeloma, and the remaining 24% had various other cancer diagnoses.

Table 1 Demographics, morbidity and analysis of variance between GCPS groups

Tabel 1, Demographic and morbidity data									Analysis of variance (AI	
		Total n= 270		Mild n=34		Bothersome n = 70		High Impact n=166		ANOVA, p	Mild vs. Bc
Demographics	**Age (years)**										
	Mean (95% CI)	55,2	(53,9 ; 56,6)	56,1	(52,5 ; 59,7)	54,7	(52,1 ; 57,4)	55,3	(53,6 ; 57,0)	0,8	
	Sex										
	% Female	89		91,2		85,7		89,8			
Pain	**Pain duration**										
	< 3 months n, %	23	8,5%	6	17,7%	6	8,6%	11	6,6%	0,03	1
	3-6 months n, %	34	12,6%	<5	<10%	13	18,6%	18	10,8%		
	6-12 months n, %	64	23,7%	11	32,4%	20	28,6%	33	19,9%		
	>1 year n, %	148	54,8%	13	38,2%	31	44,3%	104	62,7%		
	Pain intensity (past week)										
	Mean (95% CI)	5,7	(5,5 ; 5,9)	3,7	(3,3 ; 4,1)	5,8	(5,4 ; 6,1)	6,1	(5,9; 6,4)	0,00	0,00
	Mild (1-3) n, %	34	12,6%	18	52,9%	<5	<5%	13	7,8%	0,00	0,00
	Moderate (4-6) n, %	137	50,7%	15	44,1%	46	65,7%	76	45,8%		
	Severe (>=7) n, %	99	36,7%	<5	<5%	21	30,0%	77	45,8%		
	Pain distribution, (0-71 regions)										
	Mean (95% CI)	19,1	(17,7 ; 20,6)	15,7	(11,6 ; 19,9)	17,6	(15,3 ; 19,9)	20,5	(18,6 ; 22,4)	0,04	1
	Widespread pain (WP 1990)										
	n, %	164	60,7%	16	47,1%	38	54,3%	110	66,3%	0,05	1
Disability	**Daily activities limited by pain (past week)**										
	Not at all n, %	32	11,9%	10	29,4%	12	17,1%	10	6%	0,00	0,28
	A little n, %	134	49,6%	21	61,8%	42	60%	71	42,8%		
	Quite a bit n, %	82	30,4%	<5	<10%	14	20%	66	39,8%		
	Very much n, %	22	8,2%	<5	<5%	<5	<5%	19	11,5%		
	Pain disability index (PDI 5 items: 0-50)										
	Mean (95% CI)	25,6	(24,3 ; 26,8)	13,8	(11,0 ; 16,6)	22,0	(20; 24,1)	29,5	(28,1 ; 30,8)	0,00	0,00
Health & QoL	**Self rated health (PROMIS: 1-6) higher is better**										
	Mean (95% CI)	2,3	(2,3 ; 2,4)	2,6	(2,3 ; 2,8)	2,5	(2,3 ; 2,7)	2,2	(2,1 ; 2,3)	0,00	1
	Self rated quality of life past week (0-7) higher is better										
	Mean (95% CI)	4,1	(4 ; 4,3)	4,6	(4,2 ; 5,1)	4,2	(3,9 ; 4,5)	4	(3,9 ; 4,2)	0,01	0,15
Psychological	**Depression (PHQ9: 0-27) higher is worse**										
	Mean (95% CI)	8,9	(8,4 ; 9,4)	6,8	(5,5 ; 8,2)	8,7	(7,7 ; 9,7)	9,4	(8,7 ; 10,1)	0,01	0,11
	Anxiety (GAD7: 0-21) higher is worse										
	Mean (95% CI)	5,6	(5,1 ; 6,1)	4,5	(3,3 ; 5,7)	5,5	(4,5 ; 6,6)	5,8	(5,1 ; 6,5)	0,27	
	Pain catastrophizing (PCS Question 3, 0-10) higher is worse										
	Mean (95% CI)	5,1	(4,8 ; 5,4)	3,4	(2,7 ; 4,0)	5	(4,5; 5,6)	5,5	(5,2 ; 5,9)	0,00	0,00

Table 1 also shows the analysis of variance (ANOVA) between the three groups mild, bothersome, and high impact pain according to the GCPS-R. The three groups were similar in terms of age, gender, marital status, educational background and health behaviour (see Supplementary table 2).

Pain Characteristics, psychological distress, health and QoL

Patients with HICP reported significantly higher levels of pain intensity and -disability, higher depression scores, more widespread pain, and lower self-rated health and quality of life compared to those in the bothersome and mild groups (all p<0.05) (Table 2). Mean pain intensity corresponded to moderate-to-severe levels in the high-impact group, moderate in the bothersome group, and low in the mild group. Widespread pain was reported by approximately two-thirds of patients with HICP. Pain catastrophizing scores and disability scores were also significantly higher in the HICP and bothersome groups compared to the mild chronic pain group.

HICP – comparison between cancer survivors and matched patients from the Pain Center

Patients from the interdisciplinary Pain Center reported higher scores on pain intensity (d = 0.27, p<0.01), pain-related disability (d = 0.80, p<0.01), depressive symptoms (d = 0.27, p<0.01), and pain catastrophizing (d = 0.49, p<0.01), larger pain distribution (d = 0.24, p<0.05), and lower self-rated health (d = 0.64, p<0.01) (Table 2). No significant difference was observed in anxiety symptoms (GAD-7; d = 0.07, p=0.61).

Table 2 Comparison, high impact participants

Table 2: Comparison, high impact participants

		Non-cancer HICP n= 498		Cancer HICP n=166		T-test, p	Effect size, d
Demographics	**Age (years)**						
	Mean (95% CI)	54,6	(53,6 ; 55,6)	55,3	(53,6 ; 57,0)		
	Sex						
	%Female	89,8		89,76			
Pain	**Pain intensity (during past week)**						
	Mean (95% CI)	7,7	(7,6 ; 7,8)	6,1	(5,9 ; 6,4)	0,00	1,03
	Pain distribution, (0-71 regions)						
	Mean (95% CI)	24,5	(23,0 ; 26,1)	20,5	(18,6 ; 22,4)	0,01	0,24
	Widespread pain (WP 1990)						
	n, %	289	58,0%	110	66,3%	0,06	RR=1,14
Disability	**Pain disability index (PDI 5 items: 0-50) higher is worse**						
	Mean (95% CI)	36,4	(35,7 ; 37,2)	29,5	(28,1 ; 30,8)	0,00	0,80
Health	**Self rated health (PROMIS: 1-5) higher is better**						
	Mean (95% CI)	1,8	(1,7 ; 1,8)	2,2	(2,1 ; 2,3)	0,00	0.64
Psychological	**Depression (PHQ9: 0-27) higher is worse**						
	Mean (95% CI)	10,8	(10,3 ; 11,3)	9,4	(8,7 ; 10,1)	0,00	0,27
	Anxiety (GAD7: 0-21) higher is worse						
	Mean (95% CI)	6,0	(5,6 ; 6,5)	5,8	(5,1 ; 6,5)	0,61	0,05
	Pain catastrophizing (PCS Question 3, 0-10) higher is worse						
	Mean (95% CI)	6,7	(6,5 ; 7,0)	5,5	(5,2 ; 5,9)	0,00	0,49

Discussion

Characteristics of cancer survivors with high-impact pain

Among cancer survivors who reported pain and were included in the pain-specific assessment, the majority met the criteria for chronic pain based on the GCPS and a substantial portion were classified with HICP. This aligns with prior research indicating a high prevalence of long-term pain among cancer survivors, both in rehabilitation settings [10] and in population-based samples [6]. Patients in the high-impact group reported higher pain intensity, pain distribution, disability, psychological distress, and pain-related cognitions, alongside lower self-rated health and quality of life compared with mild and bothersome chronic cancer pain groups. This aligns with findings in other clinical contexts, including low back pain [24] and post-surgical populations [25].

This suggests that the scale captures not only pain-related interference, but also reflects the broader psychosocial burden experienced by cancer survivors with HICP. These findings support the potential clinical utility of GCPS-R for identifying patients in need of more intensive or targeted support within cancer rehabilitation settings.

Comparing high-impact chronic pain across diagnostic contexts

To further understand the nature of HICP in cancer survivorship, we compared the clinical profiles of cancer survivors with a matched sample of patients with non-cancer HICP referred to a interdisciplinary Pain Center. Despite meeting the same impact criteria, the two groups differed on several indicators. The non-cancer group reported significantly higher pain intensity and greater pain catastrophizing, although levels were elevated in both groups.

Although the non-cancer group reported a higher number of pain areas, cancer survivors were at least as likely to fulfil the criteria for widespread pain. This pattern may reflect differences in the spatial distribution of pain rather than the number of pain sites. One possible hypothesis is that chemotherapy-induced peripheral neuropathy - often affecting both upper and lower extremities – is frequent among cancer survivors, and it may have contributed to this pattern[26, 27]. Other treatment-related contributors, such as aromatase inhibitors and surgical late effects, have also been associated with persistent, diffuse pain [4, 5, 27].

These differences may reflect underlying pain mechanisms and diagnostic classifications. According to the ICD-11, cancer-related pain is categorized as chronic secondary pain, attributable to a known disease or treatment, whereas the non-cancer group may comprise patients with chronic primary pain, where pain is the main problem and often lacks a clear biomedical cause [11, 28]. These typological distinctions may shape symptom interpretation and coping responses. Hellmann et al. [29] similarly emphasized that although high-impact pain is consistently associated with psychological burden and adverse lifestyle factors, its clinical presentation and underlying drivers differ across populations.

Implications for rehabilitation and care planning

The findings of this study underline the need for systematic assessment of pain impact — not just the presence of pain in cancer rehabilitation. HICP affects a substantial proportion of survivors and is associated with elevated psychological and functional burden. Yet, chronic cancer-related pain remains poorly assessed and treated in many clinical settings, despite having its own diagnostic code in the ICD-11.

The use of tools like the GCPS-R may help to identify those survivors in most need for intensified support. Acknowledging the heterogeneity within cancer-related HICP, there is a need for more responsive, interdisciplinary care strategies that address the complexity of chronic pain experiences in cancer survivors. These patients may require guidance and tailored interventions that extend beyond standard biomedical approaches.

This is also supported by Hofbauer et al. [3], who emphasize the importance of improving access to interdisciplinary multimodal pain therapy for patients living with chronic cancer-related pain. The differences observed between the cancer-related and non-cancer pain profiles in this study, further suggest that HICP is a heterogeneous construct, influenced by underlying pain mechanisms and contextual factors. This raises important questions about whether access to cancer-specific pain expertise should be strengthened – an issue that calls for further clinical research.

Strengths and limitations

This study was conducted in a selected population of cancer survivors, who applied for rehabilitation in a single center and who reported pain. While this limits generalizability for the whole population of cancer patients, the sample represents a clinically relevant segment of cancer patients living with or after cancer experiencing late effects due to cancer or its treatment. Strengths of the study include its prospective design, the relatively large sample size, and low levels of missing data.

The use of a well-characterized, age- and sex-matched comparison group with non-cancer HICP was also a strength. A comparison between the ‘c-module’ responders and non-responders, based on their responses to the screening Q did not reveal any striking differences in demographic or clinical characteristics, which reduces the risk of systematic non-response bias. In this context, the GCPS-R proved feasible and informative, offering a structure to identify variation in impact levels that may otherwise be overlooked.

However, some limitations should be considered. First, the study population consisted of patients who actively applied for rehabilitation due to a variety of cancer-related problems, including, but not limited to, pain. This may result in selection bias toward more resourceful or motivated individuals. Second, pain problems were categorized as cancer-related based on patient-reported data and not verified by clinical assessment. It is possible that some patients had pre-existing pain conditions unrelated to their cancer diagnosis or treatment, or that current pain reflected a combination of factors. Finally, the data were collected from a single rehabilitation center, which may limit the representativeness and applicability of the findings.

Conclusion

In this rehabilitation cohort, 61% of included cancer survivors reporting pain were classified as having HICP using the GCPS-R. GCPS-R was found useful to differentiate significant distinctions between the groups’ psychological and functional profiles. Increasing GCPS-R impact levels were associated with higher pain intensity, higher disability scores, more psychological distress, higher levels of pain catastrophizing, and worse self-rated health and quality of life.

Compared with non-cancer patients with HICP, cancer survivors reported lower pain intensity and catastrophizing but were more likely to meet criteria for widespread pain. The findings support the clinical relevance of systematically assessing pain impact in cancer survivorship and using structured classification to identify patients in need of targeted support.

Declarations

Ethics approval:

The study was registered in the Region of Southern Denmark's research project registry (journal no. 22/8657). The Regional Committees on Health Research Ethics for Southern Denmark assessed the project and concluded that it was not notifiable under Danish law, as it involved no biomedical intervention. The study was conducted in accordance with the Declaration of Helsinki.

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Author Contribution

JRJ, HBV, CME, and LJ made substantial contributions to the conception and design of the study. Data curation and analysis were performed by JRJ. The first draft of the manuscript was written by JRJ. All authors critically revised the manuscript and approved the final version for submission.

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Data Availability

The data underlying this study are not publicly available due to their individual-level nature, the associated patient confidentiality and data protection regulations. The data are therefore not available upon request.

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Figures

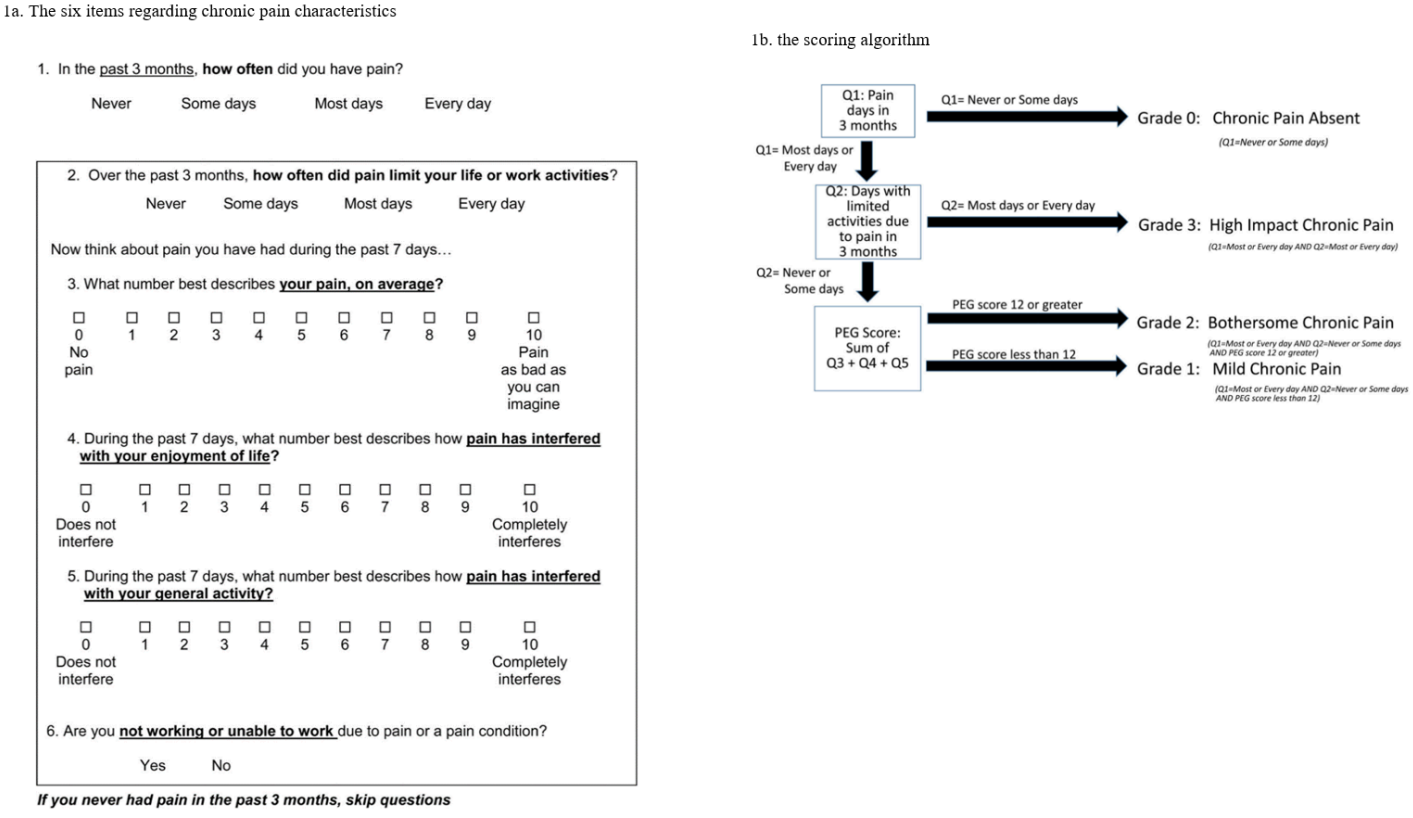


Figure 1

The Graded Chronic Pain Scale–Revised (GCPS-R) items (a) and scoring algorithm (b).

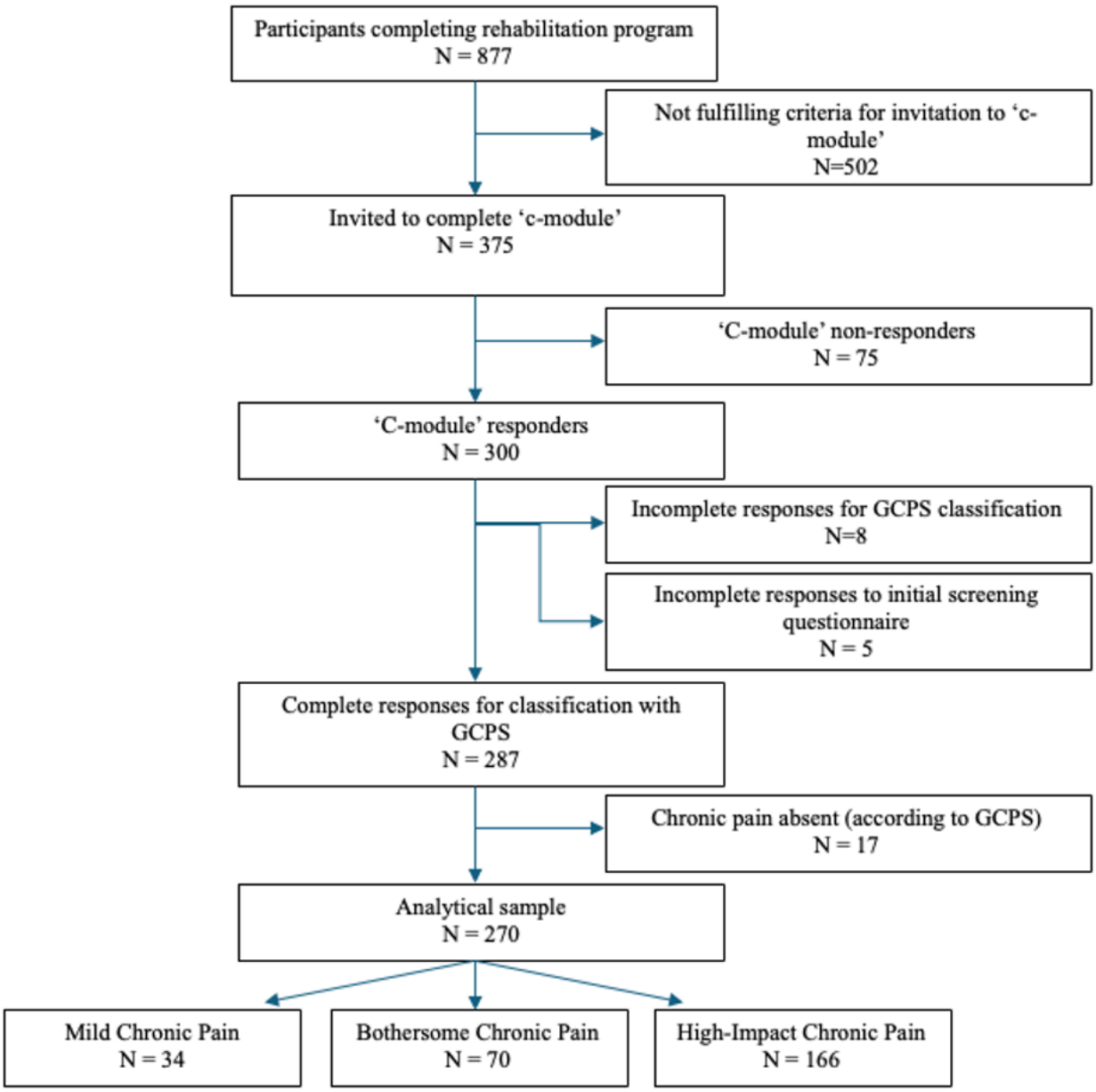


Figure 2

Flowchart of participant inclusion and pain classification in the REHPA cohort.

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