

Associations Between Problem List Items and Clinically Significant Distress in Patients With Metastatic Spine Disease

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Study Design. Retrospective cohort study.

Objective. This study aimed to identify sources of distress in patients with metastatic spine disease and elucidate factors associated with clinically significant distress.

Summary of Background Data. Distress is associated with poorer outcomes and lower quality of life in cancer patients. Patients with metastatic spine disease are particularly vulnerable to clinically significant levels of distress. However, specific factors contributing to distress in these patients have been largely unexplored.

Methods. We retrospectively reviewed medical records of patients with metastatic spine disease (MSD) who underwent surgery from 2015 to 2023. We analyzed National Comprehensive Cancer Network (NCCN) Distress Thermometer (DT) scores and Problem List items within 30 days before surgery, which was defined as “baseline” distress. We calculated the frequency of each problem and the proportion of patients with clinically significant distress (DT score ≥ 4). We used χ^2 tests to analyze associations between Problem List items and significant distress, with a significance threshold of $P < 0.05$.

Results. Among 160 patients with MSD, 48.1% reported clinically

significant distress. Patients most frequently reported Physical concerns (93.8%), followed by Emotional (55.6%) and Practical concerns (31.9%). The most common individual Problem List item was pain (72.5%), followed by fatigue (48.1%) and worry (41.2%). Emotional ($P = 0.001$), Practical ($P = 0.04$), and Social concerns ($P = 0.039$) were significantly associated with clinically significant distress, but Physical concerns were not ($P = 0.05$).

Conclusions. Though physical concerns were most common for patients with MSD, emotional and practical concerns were more strongly associated with significant distress among patients with metastatic spine disease. These findings highlight the need for multidisciplinary care focused on emotional and practical issues to enhance patients' quality of life.

Key Words: metastatic spine disease, metastatic cancer, distress, HRQOL, quality of life, psychosocial, mental health, metastatic cancer

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Distress is highly prevalent among patients with cancer, stemming from the complex interplay of diagnosis, treatment, and the emotional toll of living with a life-threatening disease.¹ Previous studies have estimated that > 60% of cancer patients experience clinically significant levels of distress.^{2–7} Among the various types of cancer, metastatic spine disease (MSD) stands out for its significant burden of disease, as it not only leads to notable physical challenges—such as mechanical, functional, and sensory deficits—but also carries a high emotional toll, contributing to a marked decline in quality of life.^{8–11}

The negative impact of distress on patient outcomes is well established. Elevated levels of psychosocial distress have been linked to worse clinical outcomes, increased mortality, and poorer overall quality of life.^{12–15} Specifically in spine surgery patients, increased distress has been associated with worse baseline clinical status and poorer postoperative outcomes.¹⁶ Despite this understanding, there remains a gap in our knowledge regarding the specific sources of distress that affect patients with MSD.

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Distress is a complex experience shaped by various factors, and identifying the most salient contributors could enable more targeted and effective interventions.

The National Comprehensive Cancer Network (NCCN) developed the Distress Thermometer (DT) and its Problem List to screen for psychosocial distress and its sources, offering a reliable tool to identify patients in need of support.^{1,17–19} The DT uses a 0-to-10 scale, with scores of four or higher considered clinically significant, and has been validated across multiple disease types and languages.^{20–22} Several studies have used the DT to assess distress in cancer patients across a variety of cancer types.^{7,23–26} Among MSD patients specifically, a prior study found that nearly half experience clinically significant distress.²⁷

The Problem List component of the DT is particularly valuable in identifying the specific sources of patients' distress, which can include physical, practical, emotional, social, or spiritual concerns. However, despite its clinical importance, very few studies have explored the Problem List component of DT across cancer populations, and to our knowledge, no study has specifically examined it in patients with MSD.^{25,26} This represents a critical gap in our understanding of the needs of patients with spine metastases, hindering the development of interventions that could more effectively alleviate distress and improve clinical outcomes.

Given the complex nature of MSD, understanding the key sources of distress is essential for developing targeted interventions to reduce distress and improve clinical outcomes. By identifying these sources among patients with spine metastases, this study seeks to provide valuable insights that could guide more effective care. We hypothesize that physical concerns, such as pain and fatigue, as well as emotional concerns, such as anxiety and fear, will be key contributors to distress.

MATERIALS AND METHODS

We conducted a retrospective chart review of adult patients diagnosed with spine metastases treated at our institution's Center for Brain and Spine Metastases. This study was deemed exempt by our institution's Institutional Review Board (IRB).

Patient Sample

Medical records for all patients with a diagnosis of spine metastases who underwent surgical intervention for their spine metastases between January 2015 and October 2023 were reviewed. Exclusion criteria included patients under 18 years of age and those without complete Distress Thermometer (DT) and Problem List data within 30 days before surgery, which was defined as "baseline" distress. Complete data were required for both the DT and Problem List on the same date.

Demographic and Distress Data

Patient demographic data, including patient age, sex, race/ethnicity, and marital status, were extracted from the electronic medical record. Preoperative baseline DT

scores and Problem List data, as well as the date of DT completion, were collected for all patients meeting inclusion and exclusion criteria. For patients undergoing multiple interventions, DT and Problem List data were taken from the baseline of the first procedure, effectively establishing a preoperative baseline.

The NCCN Distress Thermometer is a screening tool that asks patients to score their level of distress on a scale from 0 to 10, with higher scores indicating greater distress. The NCCN Problem List is a supplemental list of sources of distress, divided into 6 categories: emotional, practical, physical, social, spiritual or religious, and other.¹⁷ Patients mark items as "yes" to indicate the sources of distress they are experiencing.

The frequency of each problem list category (emotional, practical, physical, social, spiritual or religious, other) and individual items within those categories being reported were summarized. Distress scores were recorded for each patient, with mean DT scores calculated. Clinically significant distress was defined as a DT score ≥ 4 , in accordance with NCCN guidelines.¹⁷

Statistical Analysis

Descriptive statistics were used to summarize patient demographics and distress data. Continuous variables were summarized with means and standard deviations, while categorical variables were expressed as frequencies (n, %). The association between problem list items and clinically significant distress (DT score ≥ 4) was assessed using χ^2 or Fisher exact tests. Statistical analyses were performed using R Studio Version 4.2.2 (R Foundation for Statistical Computing, Vienna, Austria). A *P*-value of < 0.05 was considered statistically significant.

RESULTS

Patient Characteristics

One hundred sixty patients met the inclusion criteria. The mean age was 63 years (SD 13 y). Approximately half ($n = 78$, 48.8%) were female, two thirds were married ($n = 110$, 68.8%), and nearly three quarters identified as Caucasian/White ($n = 115$, 71.9%) (Table 1).

Problem List Category and Item Frequency

Patients responded "yes" to a mean of 3.9 ± 3.1 problem list categories and 6.3 ± 4.9 problem list items. The most frequently reported problem list category was physical concerns ($n = 150$, 93.8%), followed by emotional ($n = 89$, 55.6%) and practical concerns ($n = 51$, 31.9%) (Figure 1, Table 2).

The most commonly reported individual problem list item was Pain ($n = 116$, 72.5%), followed by fatigue ($n = 77$, 48.1%), worry ($n = 66$, 41.2%), nervousness ($n = 57$, 35.6%), sleep problems ($n = 50$, 31.2%), and tingling in hands/feet ($n = 50$, 31.2%) (Table 3).

Problem List and Distress

The mean distress score was 3.94 ± 3.05 . Among Problem List categories, patients reporting problems in the Social category had the highest mean distress score

TABLE 1. Patient Characteristics

Demographic variable	No. patients (N = 160)
Age*	62.6 (13.0)
Age (categorical), n (%)	
< 65	38 (52.1)
≥ 65	35 (47.9)
Gender, n (%)	
Female	78 (48.8)
Male	82 (51.2)
Race (complete), n (%)	
American Indian or Alaskan Native	1 (0.62)
Asian	4 (2.50)
Black or African American	30 (18.8)
Caucasian/White	115 (71.9)
Not Reported/Declined	5 (3.12)
Other	5 (3.12)
Race (categorical), n (%)	
Non-White	45 (28.1)
Caucasian/White	115 (71.9)
Marital status (complete)	
Divorced	17 (10.6)
Legally separated	2 (1.25)
Life partner	1 (0.62)
Married	110 (68.8)
Single	12 (7.50)
Unknown	1 (0.62)
Widowed	17 (10.6)
Marital status (categorical)	
All others	49 (30.6)
Life partner or married	111 (69.4)

*Data presented as mean (SD).

(5.52 ± 3.01), followed by those reporting Practical (5.10 ± 2.98) and Emotional concerns (4.63 ± 2.72) (Table 2).

Among the most commonly reported problem list items (pain, fatigue, and worry), patients reporting worry had the highest mean distress score (4.89 ± 2.66). Distress was also notably high among patients reporting transportation concerns (7.50 ± 1.64), appearance (6.89 ± 1.36), relationships with children (6.50 ± 1.00), work or school difficulties (6.50 ± 1.00), and bathing or dressing issues (6.17 ± 2.95). A full list of

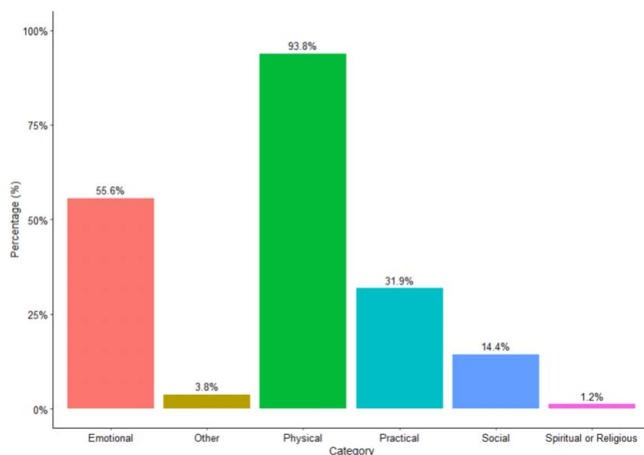


Figure 1. Problem list items by category.

TABLE 2. Descriptives of Distress by Problem List Category

Problem list category	No. patients reporting (N = 160), n (%)	Mean (SD) distress score
Physical	150 (93.8)	4.05 (3.09)
Emotional	89 (55.6)	4.63 (2.72)
Practical	51 (31.9)	5.10 (2.98)
Social	23 (14.4)	5.52 (3.01)
Other	6 (3.75)	2.83 (2.56)
Spiritual or religious	2 (1.25)	4.50 (6.36)

reported Problem List items and their associated mean distress scores is provided in Table 3.

Association Between Problem List Categories and Clinically Significant Distress

A total of 83 patients (48.1%) reported clinically significant distress (DT score ≥ 4). The presence of emotional, practical, and social problem list items was sig-

TABLE 3. Descriptives of Distress by Problem List Item

Problem list item	No. patients reporting (N = 160), n (%)	Mean (SD) distress score
Pain	116 (72.5)	4.13 (3.14)
Fatigue	77 (48.1)	4.74 (3.21)
Worry	66 (41.2)	4.89 (2.66)
Nervousness	57 (35.6)	4.74 (2.81)
Sleep	50 (31.2)	4.52 (3.14)
Tingling in hands/feet	50 (31.2)	4.20 (3.00)
Getting around	48 (30.0)	4.94 (3.21)
Fear	45 (28.1)	4.82 (2.61)
Constipation	43 (26.9)	4.77 (3.39)
Treatment decisions	37 (23.1)	5.14 (3.09)
Sadness	35 (21.9)	5.51 (2.62)
Changes in Eating	32 (20.0)	5.53 (2.68)
Depression	31 (19.4)	5.29 (2.51)
Skin dry/itchy	26 (16.2)	4.08 (3.14)
Feeling swollen	25 (15.6)	5.64 (2.91)
Memory or concentration	25 (15.6)	5.20 (3.16)
Bathing/dressing	23 (14.4)	6.17 (2.95)
Loss of interest or enjoyment	22 (13.8)	4.73 (2.88)
Insurance	21 (13.1)	5.29 (2.72)
Nausea	20 (12.5)	5.60 (2.93)
Breathing	20 (12.5)	4.95 (2.24)
Changes in Urination	17 (10.6)	5.06 (2.93)
Nose dry/congested	15 (9.38)	5.20 (2.91)
Diarrhea	14 (8.75)	3.43 (2.65)
Family health issues	13 (8.12)	5.92 (3.35)
Work/school	10 (6.25)	6.50 (2.27)
Relationship with Spouse or Partner	10 (6.25)	5.30 (2.75)
Appearance	9 (5.62)	6.89 (1.36)
Sexual health	9 (5.62)	4.89 (2.89)
Indigestion	8 (5.00)	6.12 (4.58)
Transportation	6 (3.75)	7.50 (1.64)
Mouth sores	6 (3.75)	3.33 (2.34)
Other	6 (3.75)	2.83 (2.56)
Housing	5 (3.12)	6.00 (2.45)
Relationship with children	4 (2.50)	6.50 (1.00)
Spiritual/religious	2 (1.25)	4.50 (6.36)
Ability to have children	1 (0.62)	—

nificantly associated with clinically significant distress. Specifically, the percentage of patients reporting emotional concerns was significantly higher in those with clinically significant distress compared with those without (68.7% vs. 41.6%, $P=0.001$). Similarly, Practical (39.8% vs. 23.4%, $P=0.04$) and Social concerns (20.5% vs. 7.8%, $P=0.039$) were more prevalent in the clinically significant distress group (Table 4).

Although the majority of patients with clinically significant distress (97.6%) reported physical concerns, the association between physical concerns and clinically significant distress was not statistically significant ($P=0.05$).

Association Between Problem List Items and Clinically Significant Distress

Several specific problem list items were associated with clinically significant distress: appearance ($P=0.003$), bathing or dressing ($P=0.003$), breathing ($P=0.048$), changes in eating ($P=0.002$), depression ($P=0.003$), fatigue ($P=0.017$), fear ($P=0.03$), feeling swollen ($P=0.016$), getting around ($P=0.023$), nausea (5 $P=0.014$), sadness ($P=0.001$), transportation ($P=0.029$), work or school ($P=0.019$), and worry ($P<0.001$) (Appendix 1, Supplemental Digital Content 1, <http://links.lww.com/BRS/C678>).

Among these 14 Problem List items associated with clinically significant distress, fatigue (57.8%) was the most commonly reported item, followed by worry (55.4%) and getting around (38.6%).

Notably, pain was the most prevalent problem list item overall (reported by 77.1% of patients with clinically significant distress), yet it was not significantly associated with clinically significant distress ($P=0.17$). In addition, 3 items (relationship with children, transportation, and appearance) were exclusively reported by patients with clinically significant distress (Fig. 2).

DISCUSSION

This study is the first to explore specific sources of distress among patients with metastatic spine disease (MSD) and to identify which contributes to clinically significant distress. Our findings reveal that distress in this population is multifactorial, with emotional, practical, and social concerns emerging as key drivers. While physical concerns—particularly pain—were most frequently reported, they were not associated with clinically significant distress. In contrast, emotional concerns such as worry and anxiety were strongly linked to higher levels of distress, highlighting the substantial psychological burden these patients face. These results underscore the need for targeted, patient-centered interventions that address both physical and emotional challenges.

Elevated distress is common among cancer patients, particularly those with advanced cancer, and is associated with poor outcomes and reduced quality of life.^{1,12–14,28,29} For patients with MSD specifically, prior research has shown that nearly half experience clinically significant distress, yet little research has explored the specific sources.²⁷ This study helps fill that gap by identifying

TABLE 4. Associations Between Problem List Items and Clinically Significant Distress

Distress PL Category	Distress score < 4 (n = 77)	Distress score ≥ 4 (n = 83)	P
Emotional			0.001**
No	45 (58.4%)	26 (31.3%)	
Yes	32 (41.6%)	57 (68.7%)	
Physical			0.050
No	8 (10.4%)	2 (2.41%)	
Yes	69 (89.6%)	81 (97.6%)	
Practical			0.040*
No	59 (76.6%)	50 (60.2%)	
Yes	18 (23.4%)	33 (39.8%)	
Social			0.039**
No	71 (92.2%)	66 (79.5%)	
Yes	6 (7.79%)	17 (20.5%)	
Spiritual or religious			1.000
No	76 (98.7%)	82 (98.8%)	
Yes	1 (1.30%)	1 (1.20%)	
Other			1.000
No	74 (96.1%)	80 (96.4%)	
Yes	3 (3.90%)	3 (3.61%)	

* $p < 0.05$.

** $p < 0.01$.

emotional, practical, and social concerns as major contributors to distress in this population, providing actionable insights for intervention and improved clinical care.

Physical Concerns

Pain and fatigue were the most reported physical concerns in our cohort. Pain is a well-known challenge in spinal metastases, often accompanied by neurological deficits and functional limitations. Fatigue frequently co-occurs with pain and is a recognized issue in cancer patients.³⁰ Indeed, the NCCN guidelines recommend addressing contributing factors such as pain or emotional distress as the first step in managing fatigue.³¹

Despite the high prevalence of these concerns, pain, and fatigue were not associated with clinically significant distress in our study—contrasting with findings from other cancer populations where physical symptoms like pain are strongly linked to distress.^{32,33} One possible explanation is that patients with MSD may be better prepared for cancer-related pain and develop coping strategies over time, reducing its psychological impact. In addition, the routine discussion and management of pain by health care providers may further mitigate its role in distress.

Emotional Concerns

Emotional concerns, such as worry, anxiety, fear, and sadness, were the second-most reported category, with a higher prevalence among patients experiencing clinically significant distress. Traditionally, distress in cancer patients has been attributed primarily to uncontrolled physical symptoms, particularly pain. However, our findings challenge this assumption, revealing that emotional concerns—not physical ones—are the strongest drivers of distress in MSD patients.

This aligns with prior research highlighting the substantial psychological burden experienced by patients

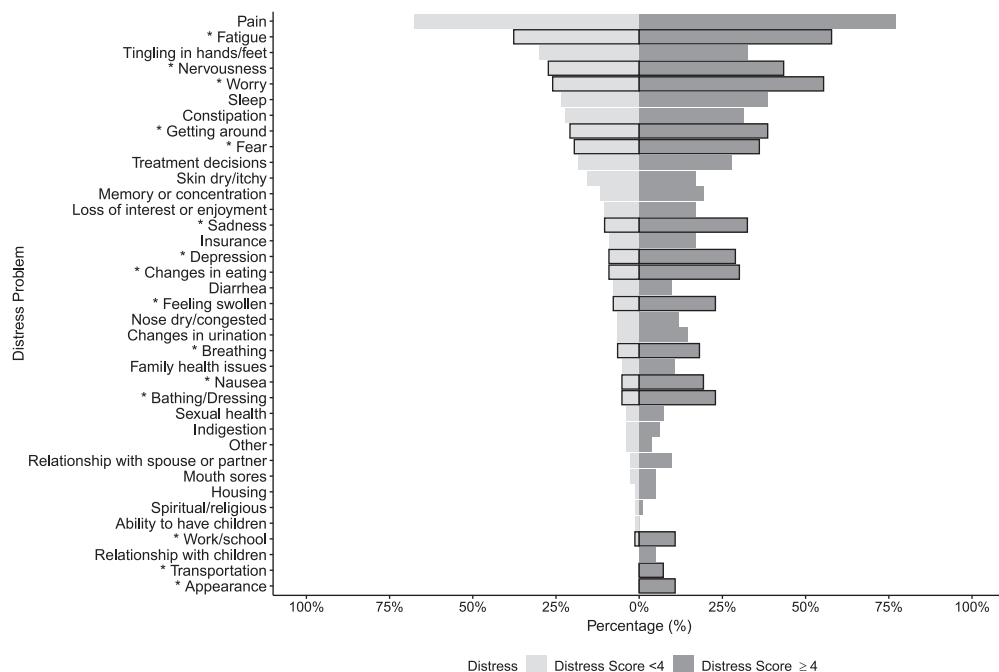


Figure 2. Associations between problem list items and clinically significant distress. *indicates significant difference ($P < 0.05$).

with metastatic cancer, who often struggle with anxiety and depression due to uncertainties about disease progression, treatment, and its impact on relationships and quality of life.^{1,34,35} The demands of treatment, frequent medical visits, escalating costs, and increasing dependence on caregivers further exacerbate feelings of guilt and fear of being a burden.^{36–38} These findings highlight a critical gap in oncology care models, which prioritize pain management while underemphasizing psychological and social support.

The lack of association between physical concerns and distress, contrasted with the strong link between emotional concerns and distress, underscores the need for proactive mental health support and patient education regarding the psychological toll of advanced cancer. Many patients may be unprepared for the emotional impact of their diagnosis, reinforcing the necessity of a comprehensive care model integrating structured mental health support alongside traditional oncologic care. The underutilization of palliative care in spine metastases further emphasizes the need for earlier and more effective psychosocial interventions.³⁹ Furthermore, untreated anxiety and depression are linked to poorer outcomes in cancer patients, making systematic distress screening and early mental health interventions critical in MSD care.^{40,41}

These findings also present a critical opportunity for spine surgeons to take a more proactive role in addressing the psychological burden of MSD. By integrating routine mental health and/or palliative care referrals early in the treatment course, clinicians can move beyond symptom management to provide truly comprehensive, patient-centered care—addressing not only physical symptoms but

also the emotional and practical challenges that profoundly affect the quality of life.

Practical Concerns

Practical concerns, such as transportation difficulties and disruptions to work or school, were less frequently reported than emotional or physical concerns but were significantly more common among patients with clinically significant distress. These challenges may exacerbate feelings of dependence, guilt, and frustration, making it harder for patients to manage their condition effectively.

Functional limitations, frequently resulting from pain, are closely tied to these practical issues, as they can prevent patients from fulfilling essential roles, such as caring for children or maintaining employment. Financial strain due to income loss or treatment costs, along with transportation difficulties, further complicates care and heightens distress.⁴² The absence of social support can compound these struggles, affecting treatment adherence and overall well-being.^{43,44} Given the considerable burden posed by these barriers, incorporating strategies to address mobility, transportation, and social support into care plans may help alleviate distress and improve patient outcomes. Community-based transportation solutions and enhanced social support systems could serve as important interventions.

Clinical Implications

The strong association between emotional, practical, and social concerns with distress in MSD patients underscores the need for a shift in standard clinical care. While pain management remains essential, our findings indicate that distress must be approached through a broader, multidisciplinary approach.

For those experiencing significant emotional distress, standard care should include early referrals to emotional support services, counseling, and/or palliative care to mitigate concerns such as worry, anxiety, and fear. In addition to these services, psychological counseling and structured support groups—which have proven beneficial in improving quality of life and emotional well-being in other oncology populations—should be considered as part of the care model for MSD patients.^{45–47}

In addition, practical barriers such as transportation difficulties and financial strain must be addressed through enhanced social work involvement and resource navigation programs. Clinicians should work closely with hospital-based social workers and patient navigators to connect patients with financial assistance, transportation resources, and workplace accommodations.

By recognizing distress as a multifaceted issue—rather than one driven primarily by pain—health care teams can implement comprehensive, patient-centered interventions that extend beyond traditional symptom management. Future research should focus on evaluating the effectiveness of these interventions and determining best practices for integrating them into routine MSD care.

Limitations

This study's cross-sectional design limits the ability to establish causal relationships between distress and problem list items. Longitudinal studies are needed to assess how these concerns evolve over time and their impact on distress. In addition, the relatively small sample size (160 patients) and single-institution setting may limit the generalizability of our findings, particularly across different geographic regions or health care systems. Our sample exclusively included patients with symptom burdens requiring surgical intervention, which means the results may not be applicable to asymptomatic patients, those with lower symptom burdens who do not require surgery, or patients who are not candidates for surgery. Furthermore, only patients with complete DT and Problem List data were included, which could introduce selection bias.

Despite these limitations, this study provides important new insights by challenging traditional models of distress in cancer care, particularly those that emphasize pain as the primary driver of distress. While future prospective studies are needed to evaluate the efficacy of interventions, our study offers actionable recommendations for improving psychosocial care in MSD patients and contributes to a refined understanding of distress management in this population.

CONCLUSIONS

This study provides valuable insights into the sources of distress among patients with metastatic spine disease (MSD), revealing that distress in this population is driven by a complex interplay of factors. While physical symptoms such as pain and fatigue are prevalent, emotional concerns—particularly worry, anxiety, and fear—are more strongly linked to clinically significant distress,

highlighting the substantial psychological burden faced by these patients. These findings emphasize the importance of comprehensive, multidisciplinary care that addresses both physical and psychological aspects of patient well-being. Targeted interventions to alleviate emotional distress and address practical concerns—alongside effective management of physical symptoms—can improve quality of life and overall outcomes. Integrating psychological support and practical assistance into treatment plans is essential for providing holistic care and enhancing the patient experience.

➤ Key Points

- ❑ Patients with metastatic spine disease (MSD) have high rates of distress, with physical, emotional, and practical concerns being the most common.
- ❑ Emotional, practical, and social concerns were significantly associated with distress levels in MSD patients, while physical concerns were not.
- ❑ Multidisciplinary care, focused on emotional and practical issues, may improve the quality of life for MSD patients.

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