

Original Article

Cancer Worry and Supportive Care Needs in Patients with Polycythemia Vera: A Single-center Cross-sectional Study

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ABSTRACT

Aim: Polycythemia vera (PV) is a chronic, lifelong myeloproliferative neoplasm. Even when hematological targets are controlled, patients often experience significant physical symptoms, emotional strain, and unmet informational needs. Evidence linking cancer-related worry to supportive care needs in PV remains limited. In this study, we examined the association between cancer worry and supportive care needs and explored whether these outcomes differed across demographic groups.

Methods: In this single-center cross-sectional study, 70 adult patients with PV completed the eight-item Cancer Worry Scale (CWS) and the 31-item Turkish version of Supportive Care Needs Survey (SCNS) between March and September 2024. The primary outcome was the correlation between total CWS and SCNS scores, assessed using Spearman's rank correlation. Demographic comparisons were treated as exploratory. Where possible, we report non-parametric effect sizes; pairwise p values after significant omnibus tests were Bonferroni-adjusted within the corresponding test.

Results: The study cohort comprised 47 men and 23 women. The median total scores were 8.0 [interquartile range (IQR): 8.0-12.8] for the CWS and 53.0 (IQR: 45.0-65.0) for the SCNS. Cancer worry was modestly and positively correlated with overall supportive care needs (Spearman rho=0.315, 95% confidence interval: 0.086-0.512; p=0.008). Female patients reported significantly higher cancer worry than males (U=390.0, p=0.035; rank-biserial correlation=0.278), whereas male patients reported higher sexuality-related needs (U=424.5, p=0.032; rank-biserial correlation=0.215). Psychological needs varied significantly by income status (H=6.621, p=0.036); after Bonferroni adjustment, low-income participants scored higher than middle-income participants (adjusted p=0.034). Additional exploratory analyses also showed differences in physical/daily-living needs based on education and in sexuality needs based on age.

Conclusion: In this single-center PV cohort, higher cancer worry was modestly associated with increased supportive care needs. The demographic subgroup results should be read as exploratory because some categories were very small, multiple outcomes were tested, and clinical covariates were not available. These findings support prospective work on individualized psychosocial and supportive-care assessment rather than a definitive screening pathway.

Keywords: Anxiety, needs assessment, patient-centered care, polycythemia vera, supportive care

Introduction

Polycythemia vera (PV) is a chronic JAK2-mutated myeloproliferative neoplasm marked by clonal erythrocytosis and, in many patients, leukocytosis, thrombocytosis, splenomegaly, microvascular disturbances, and constitutional symptoms. Current treatment strategies aim to mitigate thrombotic risk and maintain hematologic parameters within

target ranges; yet patients still face lifelong surveillance, repeated phlebotomy or cytoreductive therapy, persistent symptoms, and the inherent risk of thrombosis or transformation to secondary myelofibrosis or acute leukemia [1,2].

Routine clinical end points do not capture the full burden of PV. In fact, PV patients often suffer from fatigue, pruritus, and emotional distress, even when their blood counts are

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under control. Across Philadelphia chromosome-negative myeloproliferative neoplasms, physical and psychological symptom burdens tend to occur together, so psychosocial assessment should sit alongside disease-focused monitoring rather than remain an optional extra.

Cancer worry refers to persistent concern about developing cancer, recurrence, or progression which can be effectively measured with the Cancer Worry Scale (CWS) [3]. Supportive care needs span psychological, health-system and informational, physical/daily-living, care and support, and sexuality-related domains [4]. When these needs go unnoticed, communication, adaptation, quality of life, and engagement with long-term cancer care may suffer. Even so, cancer worry and supportive care needs have rarely been examined together in PV.

Therefore, the primary objective of this study was to estimate the association between cancer worry and overall supportive care needs in adults with PV. Secondary objectives were to describe the distribution of supportive care domains and to explore potential disparities based on demographic characteristics. We hypothesized that higher cancer worry would be positively associated with greater overall supportive care needs.

Methods

Study Design and Setting: This single-center cross-sectional survey was conducted in the Hematology Outpatient Clinic of Kütahya Health Sciences University, Kütahya Training and Research Hospital between March 30 and September 30, 2024. The manuscript follows the Strengthening the Reporting of Observational Studies in Epidemiology principles.

Participants: Adults aged 18-85 years with an established diagnosis of PV were eligible for inclusion. To reduce confounding of cancer-related worry and supportive care needs, we excluded patients with a concurrent or previous second malignancy. All eligible patients attending the clinic during the prespecified period were invited; 70 consented and provided complete questionnaire data, so no imputation was needed. We did not perform a formal a priori sample-size calculation because the study used a consecutive census sample of the accessible clinic population.

Measures: Demographic variables included biological sex, age group, marital status, educational level, income, occupation, and a family history of cancer in a first-degree relative. The source form recorded female/male sex and did not assess gender identity; we therefore use the term sex throughout. Questionnaires were administered via face-to-face interviews to support comprehension and completeness. Because interviewer administration can shape disclosure, especially for psychological and sexuality-related items, we treated this procedure as a potential source of social-desirability and interviewer bias.

The CWS includes eight items scored from 1 (never or almost never) to 4 (almost always), giving a total score ranging from 8 to 32; higher scores indicate greater cancer-related worry

[3]. We used the Turkish-language adaptation described by Üner [5]. Internal consistency was excellent in this sample (Cronbach's $\alpha=0.952$).

The Turkish Supportive Care Needs Survey (SCNS) contains 31 items across five domains: psychological, health-system and information, physical and daily living, patient care and support, and sexuality [6]. Higher scores indicate greater supportive care needs. Internal consistency of the total scale was excellent in this sample (Cronbach's $\alpha=0.919$).

Statistical Analysis

Analyses were performed using IBM SPSS Statistics (version 29.0; IBM Corp., Armonk, NY, USA). Categorical variables are summarized as frequencies and percentages. Continuous scale scores are reported as mean $\pm$ standard deviations, medians with interquartile ranges (IQRs), and ranges to assess both central tendency and data distribution. We checked distributional assumptions before group comparisons. Because several scores were bounded and non-normally distributed, inferential comparisons relied mainly on Mann-Whitney U or Kruskal-Wallis tests.

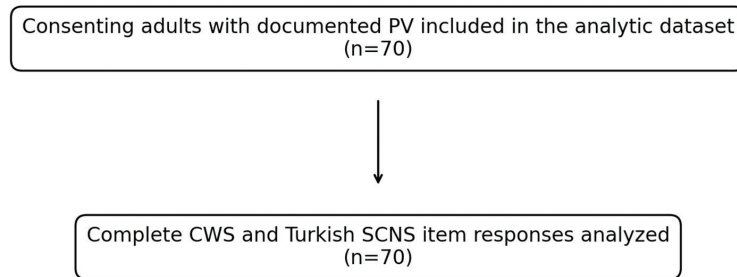
The primary hypothesis concerned the monotonic association between total CWS and total SCNS scores and was tested with Spearman's rank correlation. A 95% confidence interval for the correlation was estimated utilizing the Fisher z transformation. For two-group Mann-Whitney comparisons, we calculated the rank-biserial correlation as an interpretable nonparametric effect size. For Kruskal-Wallis tests, epsilon-squared was calculated as $(H-k+1)/(n-k)$, where H is the test statistic, k is the number of groups, and n is the sample size. Pairwise comparisons after significant omnibus tests were adjusted with the Bonferroni method.

The primary analysis used a two-sided alpha level of 0.05 without multiplicity adjustment. Demographic and domain-level analyses were explicitly exploratory; we report exact p values and effect sizes and do not frame the conclusions as confirmatory. We did not build multivariable models because the dataset contained sparse demographic categories (including categories with only one participant), lacked key clinical covariates such as symptom burden and treatment exposure, and would therefore have supported unstable, data-driven adjustment rather than a clinically interpretable, prespecified model.

Ethics: The Kütahya University Non-Interventional Clinical Research Ethics Committee approved the study (approval no: 2024/01-26, date: 15.01.2024). All participants provided written informed consent. The study was conducted in accordance with the Declaration of Helsinki.

Results

Participant Characteristics: Seventy adults with PV were included, with no missing questionnaire data (Figure 1). Forty-seven participants (67.1%) were male and 23 (32.9%) were female. Almost half were aged 65 years or older, 71.4% were married, and 60.0% were in the low-income group (Table 1).



Numbers screened, excluded before consent, and declining participation were not retained; response rate could not be calculated.

Figure 1. Participant flow through the study

SCNS: Supportive Care Needs Survey, PV: Polycythemia vera, CWS: Cancer Worry Scale

Characteristic	Category	n (%)
Sex	Male	47 (67.1)
	Female	23 (32.9)
Age, years	25-34	4 (5.7)
	35-44	7 (10.0)
	45-54	8 (11.4)
	55-64	19 (27.1)
	≥65	32 (45.7)
Marital status	Single	20 (28.6)
	Married	50 (71.4)
Education	No formal education	10 (14.3)
	Primary education	33 (47.1)
	High school	15 (21.4)
	University degree	11 (15.7)
	Postgraduate	1 (1.4)
Income	Low	42 (60.0)
	Middle	27 (38.6)
	High	1 (1.4)
Occupation	Unemployed	19 (27.1)
	Housewife	22 (31.4)
	Civil servant	12 (17.1)
	Private-sector employee	5 (7.1)
	Self-employed	12 (17.1)

Several demographic strata were sparse; in particular, the postgraduate and high-income categories each contained only one participant.

Scale Distributions and Reliability: The mean score for the CWS was 10.97 ± 4.72 , and the median was 8.0 (IQR: 8.0-12.8), reflecting a floor-skewed distribution. The total SCNS mean score was 57.27 ± 18.68 and the median was 53.0 (IQR: 45.0-65.0). The psychological and health-system/information needs had the highest mean domain scores. Both scales showed excellent internal consistency (Table 2).

Primary Analysis: Cancer worry was significantly and positively associated with total supportive care needs (Spearman's $\rho=0.315$, 95% CI: 0.086-0.512; $p=0.008$). This is a modest association, indicating that participants who reported more cancer worry generally reported more supportive care needs, however, much of the variability remained unexplained (Table 3).

Exploratory Demographic Analyses: Female patients reported significantly higher cancer worry than male patients ($U=390.0$, $p=0.035$; rank-biserial correlation=0.278), whereas male patients reported higher sexuality-related needs ($U=424.5$, $p=0.032$; rank-biserial correlation=0.215). Furthermore, psychological needs varied significantly across income levels ($H=6.621$, $p=0.036$); post-hoc pairwise comparisons with Bonferroni adjustment revealed that low-income participants scored significantly higher than middle-income participants (adjusted $p=0.034$).

Discussion

We found a statistically significant but modest positive association between cancer worry and overall supportive care needs in adults with PV. We also observed exploratory demographic differences in cancer worry and selected supportive-care domains. By reporting confidence intervals, nonparametric effect sizes, corrected post-hoc tests, and the full distribution of scale scores, we aimed to separate statistical significance from clinical magnitude and avoid overstating the findings.

The association is clinically plausible. PV combines a cancer diagnosis with an often prolonged course, recurrent monitoring, thrombotic risk, treatment burden, and uncertainty about progression. A study in myeloproliferative neoplasms shows that symptom and psychological burdens coexist and may persist despite ongoing clinical management and stable disease status [7]. The present correlation suggests that worry may be a marker of broader unmet needs; its size also makes clear that cancer worry is only one part of the supportive-care burden.

Table 2. Distribution and internal consistency of patient-reported outcome scores

Measure	Possible range	Mean±SD	Median (IQR)	Observed range	Cronbach α
Cancer Worry Scale total	8-32	10.97±4.72	8.0 (8.0-12.8)	8-27	0.952
SCNS total	31-124	57.27±18.68	53.0 (45.0-65.0)	31-105	0.919
Psychological domain	9-45	18.44±8.40	17.5 (9.3-24.0)	9-43	—
Health system/information	10-50	17.86±9.49	16.0 (10.0-22.8)	10-44	—
Physical/daily living	5-25	12.29±5.29	11.0 (9.0-16.8)	5-24	—
Patient care/support	4-20	4.86±2.30	4.0 (4.0-4.0)	4-16	—
Sexuality	3-15	3.83±2.00	3.0 (3.0-3.0)	3-12	—

Domain-specific alpha coefficients were not available and are therefore not reported.
SCNS: Supportive Care Needs Survey, SD: Standard deviation, IQR: Interquartile range

Table 3. Primary association and selected exploratory two-group comparisons

Outcome/comparison	Method	Estimate/statistic	95% CI or effect size	p value	Interpretation
CWS total vs. SCNS total	Spearman rho	0.315	0.086 to 0.512	0.008	Modest positive association
Cancer worry: women vs. men	Mann-Whitney U	390.0	Rank-biserial $r=0.278$	0.035	Exploratory; higher distribution in females
Sexuality needs: men vs. women	Mann-Whitney U	424.5	Rank-biserial $r=0.215$	0.032	Exploratory; higher distribution in males

SCNS: Supportive Care Needs Survey, CI: Confidence interval, CWS: Cancer Worry Scale

Table 4. Significant exploratory omnibus and adjusted pairwise comparisons

Outcome	Kruskal-Wallis	Omnibus p	Epsilon-squared	Bonferroni-adjusted contrast	Adjusted p
Psychological needs by income	H(2)=6.621	0.036	0.069	Low > middle income	0.034
Physical/daily-living needs by education	H(4)=16.832	0.002	0.200	Primary education > high school	0.007
Sexuality needs by age	H(4)=13.996	0.007	0.154	45-54 years > ≥65 years	0.016
Patient care/support needs by age	H(4)=9.819	0.044	0.090	No pairwise contrast significant	—

All analyses in this table were exploratory. Pairwise p values were generated by the SPSS nonparametric pairwise-comparison procedure and adjusted with Bonferroni correction within each significant omnibus test, not across the full family of demographic outcomes. Sparse categories limit stability, particularly high income (n=1) and postgraduate education (n=1); these results are reported for completeness and should not be treated as confirmatory

In our cohort, female patients reported greater cancer worry, with a small-to-moderate nonparametric effect. Similar sex differences have appeared in population-based cancer-worry research [8-10]. Possible explanations include differences in threat appraisal, communication, symptom reporting, social roles, and willingness to disclose distress. We did not measure these mechanisms, and sex should not be used as a proxy for individual psychosocial need. The more useful implication is to assess patients directly and in a standardized way.

Conversely, male patients reported greater sexuality-related needs, although the effect was small. Gaps in sexual-function and fertility-related information have been described among male survivors of lymphoma and other cancers [11,12]. In PV, vascular symptoms, fatigue, comorbidity, age, and treatment may all affect sexual health, yet sexuality rarely enters routine hematology encounters. A neutral question that gives patients permission to raise the topic may uncover concerns that would otherwise stay undisclosed.

The income-related difference in psychological needs fits the wider literature linking financial strain to anxiety, depression, and impaired quality of life in hematologic malignancies [13,14]. At the same time, the high-income group included

only one participant, so the omnibus comparison is unstable. The safer interpretation is that lower perceived financial resources may flag a subgroup that merits closer psychosocial assessment, not that income has a causal effect.

The education- and age-related domain findings were not the primary focus of the initial analysis but were present in the verified SPSS outputs. Including them improves completeness and reduces the risk of selective reporting. They still come from multiple exploratory tests and sparse categories, however. The adjusted pairwise findings may help generate hypotheses about health literacy, functional burden, and age-sensitive sexuality counseling, but they need replication in larger samples (Table 4).

Clinical Implications

These findings justify prospective evaluation of brief needs-assessment approaches in PV clinics, but they do not establish a validated screening pathway or referral threshold. In routine care, clinicians can ask about psychological, informational, functional, and sexuality-related concerns in a confidential and nonjudgmental manner. Whether structured screening followed by targeted education, psycho-oncology referral, or

supportive-care intervention improves outcomes in PV should be tested prospectively.

Strengths and Limitations

Strengths include structured patient-reported measures, complete item-level data among analyzed participants, separation of the principal total-score association from exploratory subgroup analyses, reporting of nonparametric effect sizes where derivable, and transparent correction of within-test pairwise p values. The study also addresses an underrepresented patient-centered aspect of PV care.

Several limitations matter. The single-center cross-sectional design prevents causal or temporal inference and limits generalizability. The numbers screened, excluded, and declining participation were not retained, so selection and nonresponse bias cannot be quantified. The sample size was limited, and the high-income and postgraduate categories each contained one participant; inferential results involving these classifications are unstable. No a priori sample-size calculation was performed. We also lacked specific PV diagnostic criteria, molecular findings, disease duration, risk category, thrombosis history, treatment exposure, phlebotomy burden, hematocrit control, splenomegaly, symptom burden, comorbidity, and psychiatric history. That precluded diagnostic re-adjudication and clinically meaningful adjusted modeling. Multiple exploratory comparisons increase the chance of false-positive findings because Bonferroni adjustment was confined to pairwise contrasts within each significant omnibus test rather than the full analysis family. Borderline p values should therefore be read cautiously. Interviewer administration may have introduced social-desirability and interviewer bias, particularly for sexuality-related items. The source form recorded binary sex and did not assess gender identity. Finally, the Turkish CWS adaptation was not validated specifically in PV, and total-scale Cronbach alpha does not establish domain reliability or construct validity in this population.

Future Research

Larger multicenter studies should combine patient-reported outcomes with disease duration, treatment exposure, MPN symptom scores, thrombotic history, comorbidity, and socioeconomic measures. Longitudinal designs are needed to test whether cancer worry predicts later supportive-care use or quality-of-life deterioration. Prespecified multivariable models and external validation would clarify whether demographic differences persist after clinical adjustment.

Conclusion

In this single-center sample of adults with PV, cancer worry showed a modest positive association with overall supportive care needs. Demographic and domain-level differences were exploratory, vulnerable to sparse categories and multiple testing, and should not be interpreted as independent, causal, or definitive effects. The results support further prospective evaluation of individualized psychosocial and supportive-care

assessment alongside hematologic follow-up. Multicenter longitudinal studies that incorporate PV-specific clinical variables are needed before screening thresholds or risk-stratified care pathways can be recommended.

Ethics

Ethics Committee Approval: The Kütahya University Non-Interventional Clinical Research Ethics Committee approved the study (approval no: 2024/01-26, date: 15.01.2024).

Informed Consent: Written informed consent was obtained from all participants.

Footnotes

Authorship Contributions

Surgical and Medical Practices: N.K.K., C.Ö., Concept: C.Ö., Design: N.K.K., C.Ö., Data Collection or Processing: N.K.K., Analysis or Interpretation: N.K.K., C.Ö., Literature Search: N.K.K., C.Ö., Writing: N.K.K., C.Ö.

Conflict of Interest: No conflict of interest was declared by the authors.

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Data Availability: The dataset is not publicly available because the ethics approval did not include unrestricted public data sharing. A de-identified dataset may be considered on reasonable request, subject to institutional authorization, ethical requirements, and applicable data-protection rules.

Thesis Disclosure: This article was derived from a medical specialty thesis. The manuscript reframes the thesis question as an association study; no mediation or causal effect is claimed.

Artificial Intelligence (AI) and AI-Assisted Technologies

Statement: During the preparation of this manuscript, the authors used large language models/AI-assisted tools solely for the purpose of English language editing, grammatical correction, and improving readability. The authors state that all scientific content, data analysis, and clinical interpretations were entirely generated by the human authors, and the authors assume full responsibility for the integrity and accuracy of the content.

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