The intersectionality of gender and poverty on symptom suffering among adolescents with cancer

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Abstract

Background: To determine if the intersectionality of gender and poverty is associated with health disparities among adolescents with cancer. We hypothesized unobserved latent classes of patients exist with respect to cancer-related symptoms; and class classification varies by gender–poverty combinations.

Procedure: Cross-sectional data were collected among adolescents with cancer and families (*N* = 126 dyads) at four tertiary pediatric hospitals. Adolescents were aged 14–21 years, English speaking, cancer diagnosis, not developmentally delayed, psychotic, homicidal, suicidal, or

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SUPPORTING INFORMATION
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severely depressed. Latent class analysis and multinomial logit models were used for analysis. Patient-Reported Outcomes Measurement Information System (PROMIS) pediatric symptom measures, Short forms, evaluated anxiety, depressive symptoms, pain interference, and fatigue. Family-reported household income used 2016 Federal Poverty Level (FPL) guidelines.

Results: Three distinct groups of patients were identified using PROMIS symptom patterns: *High Distress*-25%; *High Physical/Low Psychological Distress*-14%; and *Low Distress*-62%. Female adolescents living in households with incomes at or below the 2016 FPL had 30 times the odds of being classified in the *High Distress* class (higher probabilities of experiencing anxiety, depressive symptoms, pain interference, and fatigue) compared to those in the *High Physical/Low Psychological Distress* class (female and poverty: AOR = 30.27, 95% CI 1.23, 735.10), and this was statistically significant (β = 3.41, 95% CI 0.21, 6.60; p = .04) but not compared to those in *Low Distress*.

Conclusion: Adolescent females with cancer with households in poverty had significantly greater odds of experiencing high symptom distress, compared to those with high physical but low psychological distress. More comprehensive screening and intervention, as needed, may decrease disparities.

Keywords

adolescents; cancer; gender; poverty; symptoms

1 | INTRODUCTION

Adolescents diagnosed with cancer experience high symptom distress and suffering throughout the continuum of care.[1–4] The Theory of Intersectionality posits that inequalities persist, because categories like gender, race, and class are overlapping and affect each other interdependently and may interact to exacerbate a health problem.[5,6] We could identify no studies that examined the intersectionality of gender and poverty and how they may interact to exacerbate cancer-specific symptom distress,[7] although intersectionality has been identified with some adolescent mental health outcomes.[8]

The impact of gender in isolation has been examined for adolescents diagnosed with cancer. Gender refers to a complex psychosocial construct that takes into account biology, but also the influences of society and environment.[9] Prior cross-sectional research has examined gender differences in cancer-specific symptom experience.[10] Adolescent females with cancer evidenced greater symptom distress compared to males across studies and countries.[10–16] Gender disparities may be due to differences in genetics, coping skills, gender role expectations,[16] or gender inequities in the social situations of women.[7]

The adverse impact of income on care outcomes and symptom distress has also been studied in isolation. For example, children with leukemia (N = 575) living in high-poverty areas, defined by zip code, suffered an earlier relapse compared to their wealthier counterparts.[17] Similarly, in the PediQUEST trial, children with cancer (N = 78) from low-income families, defined as at 200% of the Federal Poverty Level (FPL) or <$50,000/year, experienced higher symptom distress and worse health-related quality of life.[18]

This prior research is limited by examining gender differences and socioeconomic status (SES) separately, as well as assumptions of data homogeneity. Each may result in misleading analysis or invalid conclusions. Heterogeneity signifies diversity within a group or sample; the opposite of homogeneity when samples are more alike than different. To increase scientific rigor, we analyzed the intersectionality of gender and poverty to determine whether adolescent subgroups were at high risk for excessive symptom distress. We hypothesized (a) distinctive latent classes/groups exist in the adolescent cancer population with respect to cancer-related symptoms; and (b) the likelihood of being classified into specific symptom classes varies by different gender and poverty combinations.

2 | METHODS

This secondary analysis is part of the ongoing parent trial of FAmily CEntered pediatric Advance Care Planning (FACE pACP) for Teens with Cancer (FACE-TC), which is a longitudinal, intent-to-treat, single-blinded, randomized controlled trial for adolescents diagnosed with cancer and their family decision makers (R01NR015458-06, PI, Maureen Lyon). Participants were enrolled from four quaternary pediatric oncology hospital-based programs in the United States. Enrollment was from July 16, 2016 through April 30, 2019. Methods of this study and the protocol have been published elsewhere.[19] Randomized intent-to-treat intervention assignment occurred post baseline assessment. All data described in this study were from the completion of baseline assessments of enrolled/eligible participants, prior to randomization. This study reports primarily on the findings from the adolescent responses to the PROMIS pediatric symptom measures.

Adolescent eligibility criteria included ever diagnosed with cancer; aged 14 to <21 years; knows cancer diagnosis; and English speaking. Family eligibility criteria included 18.0 years; provider determined not developmentally delayed; English speaking; and knows patient's diagnosis. Secondary screening for exclusion criteria occurred after enrollment for severe depression,[20] homicidality,[21] suicidality,[20] and psychosis[21] to ensure competency to engage in shared decision making. Referrals were given as needed. Adolescents at various points in the illness trajectory were study eligible because our pilot study indicated that adolescents with cancer preferred to be involved in pediatric advance care planning (pACP) at various points in the illness trajectory.[22] This finding was confirmed with the present sample: 86% of adolescents wanted early discussion of ACP, rather than waiting until hospitalized or if dying.[23] Furthermore, this heterogeneity reflects the goals of the parent study, as pACP is recommended at all stages for anyone with a serious illness.[24]

The institutional review board at each site approved the protocol. Participants provided written informed consent/assent and were compensated for participation. Adolescents and legal guardians (for patients under the age of 18 years) or surrogates (chosen by patients aged 18 years and older) received a $25 gift card each for the baseline assessment. A Safety Monitoring Committee monitored the trial.

2.1 | Procedures

The clinician at each study site generated a list of potentially eligible participants coming to the outpatient clinic that week or on the inpatient service. Through the clinician, who confirmed it was okay to approach the patient that day (e.g., no bad news being given), a trained research assistant approached potentially eligible dyads in person. After asking the adolescent, and if present the family, if they were interested in participating in research and receiving a positive response; the researcher reviewed the Institutional Review Board-approved Information Sheet with the adolescent and family and then asked if they might be interested in participating. Following informed consent/assent and prior to randomization, study measures were administered in person to adolescents and families separately in a private room. Eligible dyads (patient and family) were administered measures independently at baseline (study visit 1). Trained research assistants read study questions aloud. Responses were directly entered by the RA-Assessor into the research electronic data capture system (REDCap) database. We followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guidelines for reporting our study to enhance the quality and transparency of our research (https://www.equator-network.org/reporting-guidelines/strobe/).

2.2 Measures and data collection

Demographic Data Form: It was administered by a trained research assistant at baseline to obtain participant-reported age, gender, and race/ethnicity. Families self-reported their education, employment status, household income, and number of persons residing in the household. Medical data were obtained by a trained research assistant through chart abstraction, including diagnosis, date of diagnosis, history of relapse, bone marrow transplant, and on or off active treatment.

Patient-Reported Outcomes Measurement Information System (PROMIS) pediatric symptom measures[25–27]—PROMIS uses a T-score metric in which 50 is the mean of a relevant reference population and 10 is the standard deviation (SD) of that population. A score of 60 is one SD higher than the mean of the reference population. To decrease subject burden (time) adolescents were administered the Short forms: Emotional Distress-Anxiety, Emotional Distress-Depressive Symptoms, Fatigue, and Pain Interference. Each form has eight items. The PROMIS Pain Interference items assess self-reported consequences of pain on relevant aspects of one's life. The PROMIS measures are theoretically grounded and demonstrate feasibility and acceptability. Although normative data are available only for children up to age 18 years, for ease of comparison within this study, we used PROMIS pediatric symptom measures with participants ages 18 up to 21 years. The PROMIS pediatric symptom measures have been validated in pediatric oncology clinical trials,[28] demonstrating changes over time and supporting construct and concurrent validity.[29]

Household Income: Family participants were asked, "What is your family's estimated annual income before taxes in US dollars?," "How many people are living in the patient's household? (count everyone)." The 2016 Department of Health & Human Services poverty

guidelines were later used to determine the FPL, which for a household of four was $24,250.[30]

Time-Invariant Covariates: Time-invariant covariates are age, gender, and race.

2.3 | Sample size calculations

For this study, the sample size needed for latent class analysis (LCA) for adolescents only (N = 126) was calculated using the formula of Dziak et al.[31] $N = \dfrac{m_{80}^{w^2}}{w^2}$, where w is an effect size, $m_{80}^{w^2}$ is a constant for predicting from w the required N to obtain a power of 0.80. The values of $m_{80}^{w^2}$ are estimated[31] based on bootstrap simulations for various number of indicators used for clustering and the number of classes. Our proposed LCA is based on four indicators (four patient-reported cancer-related symptoms). According to the Simulation Experiment-2 by Dziak et al.,[31] assuming a moderate effect size of $w = 0.4$, $m_{80}^{w^2} = 14.8$ for identifying two to six classes based on four indicators,[31] the sample size needed for our proposed LCA models is $N = \dfrac{14.8}{0.16} = 93$. This indicates that our baseline data with $N = 126$ is adequate for LCA.

2.4 | Statistical procedures

To test *Hypothesis 1* that distinctive unobserved subpopulations exist in the adolescent cancer sample with respect to cancer-related symptoms, LCA was used to identify potential latent classes/groups of patients.[32–35] Each PROMIS pediatric measure has a T-score with a mean of 50 and SD of 10. We used the mean (50) as the cut-off point to generate dichotomous variables for LCA. T-score $\leq$ 50 = low symptom distress and T-score >50 = high symptom distress. Although the mean value does not have much clinical meaning, LCA enabled examination of the sample heterogeneity regarding the likelihood of experiencing higher than average PROMIS symptom scores. A series of LCA models with an increasing number of latent classes were estimated. Information criterion indices (e.g., Akaike's information criterion [AIC], Bayesian information criterion [BIC], sample-size adjusted BIC [aBIC]) and some special LR tests that are not based on model chi-square statistics (e.g., Lo–Mendell–Rubin likelihood ratio test [LMR], adjusted Lo–Mendell–Rubin likelihood ratio test [aLMR], and Bootstrap likelihood ratio test [BLRT]) were used for model fit comparison. Lower information criterion indices indicate better model fit; statistically insignificant LR tests ($p = >.05$) indicate the K-class model fits data better than the (K-1)-class model. Once the optimal number of latent classes was identified, adolescent patients were classified into their most likely latent class using the estimated posterior membership probabilities. The quality of membership classification was assessed by examining average posterior probabilities and the entropy statistic. The latent classes were defined by the patterns of the probabilities of having specific patient-reported symptoms in given classes.

To test *Hypothesis 2* that the likelihood of being classified into specific symptom classes will vary by gender–poverty combinations, multinomial logit model was used to examine gender and poverty effects on patient-reported symptom patterns (latent class membership).

Gender–poverty interaction was included in the multinomial logit model to test whether gender effect on symptom patterns varies by poverty. Both the main effects and interaction were tested by two-sided Wald chi-squared statistic. Statistical significance level was set to $a = .05$. Data were analyzed using Mplus 8.4 and SAS statistical software version 9.4 (SAS Institute).

3 | RESULTS

3.1 | Participant characteristics

Three hundred sixty-six adolescent–family dyads were approached, of whom 336 dyads met initial eligibility criteria. Of these, 203 declined, three were ineligible, and 130 dyads enrolled. After enrollment four additional dyads were deemed ineligible as a result of secondary screening, leaving 126 dyads (252 participants) who met full eligibility criteria. Enrollment differed by study site: Akron Children's Hospital ($n = 80/130$ dyads; 62%), St. Jude Children's Research Hospital ($n = 11/130$ dyads; 8%), Children's National Hospital ($n = 4/130$ dyads; 3%), and the University of Minnesota Masonic Children's Hospital ($n = 35/130$ dyads; 27%). There were no statistically significant differences by study site in dyads declining to participate of those who were eligible (113/193, 59%; 23/34, 68%; 60/95, 63%; 6/10, 60%; respectively) ($p = .728$). The top three reasons for declining to participate in this 5-year trial were time issues, 37% (76/203); not wanting to talk about ACP by at least one member of the adolescent/family dyad, 23% (46/203); and not wanting to participate in research, 20% (41/203). Male participants (58%, 115/198) compared to female participants (44%, 57/130) were significantly more likely to decline participation in the trial (difference of 14%, 95% CI 4–25%, $p = .02$). Age, race, ethnicity, diagnosis, or active treatment status were not statistically significantly different between those who enrolled and those who declined participation.

Adolescents ($N = 126$) had a mean (SD) age of 16.9 years (1.9); 57% were female (69/126) and 79% (100/126) were White (Table 1). The four most common diagnoses were leukemia (42/126, 33%); solid tumor (34/126, 27%); brain tumor (25/126, 20%); and lymphoma (19/126 participants, 15%). The mean (SD) number of months the adolescent had known of their diagnosis was 84.2 (69); median (interquartile range) 69 (27, 148); 21% were on active treatment; 13% (17/126) had received a bone marrow transplant; and 12% (15/126) had ever relapsed.

3.2 | Baseline household income

Seventy-one percent of (89/126) families reported household income greater than the 2016 FPL, while 26% (33/126) reported household income equal to or below the 2016 FPL. Three percent (4/126) declined to share this information and were not included in the multinomial logit model for the PROMIS LCA to test the interaction of gender and income. One adolescent who declined to specify race was also excluded from this model. Race was dichotomized into White versus others (see Table 1).

3.3 | Symptom distress

No data were missing for the PROMIS symptom measures. Within the entire sample (N = 126), percentage who reported symptoms greater than the cut-off of T-score >50 were as follows: Emotional Distress-Anxiety 37% (mean = 46.7, SD = 9.4); Emotional Distress-Depressive Symptoms 33% (mean = 45.0, SD = 9.9); Pain Interference 29% (mean = 43.8, SD = 10.3); and Fatigue 34% (mean = 45.4, SD = 12.5). Table 2 presents the mean (SD) of PROMIS scores for each class.

3.4 | Model results

The single-class model has the largest information criterion indices, and all the Likelihood Ratio tests that compare the single-subgroup with the two-class model are statistically significant ($p < .05$). This indicates the population is not homogeneous in terms of symptom distress, but heterogeneous with at least two unobserved subclasses, regarding the four PROMIS measures. Among the multiclass models, the four-class model has all information criterion indices larger than those of the three-class model, and all Likelihood Ratio tests cannot reject the three-class model. Comparing two-class and three-class models, the former has slightly smaller information criterion indices, but all the Likelihood Ratio tests reject the two-class model. We favored the three-class model because it has better class classification (classification probabilities for classes 1, 2, and 3 are .99, .87, and 1.00, respectively, and entropy statistic is .91) and the most useful and interpretable information from a clinical perspective.

We found three unobserved distinct classes/groups of patients. The conditional probabilities of reporting higher than average PROMIS scores are similar within class, but substantially different across classes. See Figure 1. Based on the patterns of the conditional probability (i.e., the probability of reporting higher than average PROMIS scores in given class), the classes are defined as: Class 1 ($N = 78/126$, 62%): *Low Symptom Distress* (lower probabilities of having high scores in the four PROMIS measures); Class 2 ($N = 31/126$, 25%): *High Distress* (higher probabilities of having high scores in the four PROMIS measures); and Class 3 ($N = 17/126$, 14%): *High Physical/Low Psychological Distress* (high probabilities of having high scores in only pain interference and fatigue).

The results of the multinomial logit model are shown in Table 3 ($N = 121$). The model models three logits, contrasting Classes 1 versus 3, 2 versus 3, and 2 versus 1, respectively. The interaction between female and poverty is positive in the second logit, indicating female adolescents in households in poverty had 30 times the odds of being in Class 2 (*High Distress*) than in Class 3 (*High Physical, Low Psychological Distress*) (adjusted odds ratio [AOR] 30.27, 95% CI 1.23, 735.10). The confidence interval is wide indicating a level of uncertainty because of the sample size. This result is statistically significant ($\beta = 3.41$, 95% CI 0.21–6.60; $p = .04$) (see Table 4). See Supporting Information File for post hoc analyses of alternative models: (a) using race and poverty interaction (Tables S1 and S2); (b) adding "on active treatment," which resulted in odds remaining high for gender–poverty interactions in Class 2 versus Class 3 (AOR 19.69, 95% CI 0.75–512.86) (Table S3), but lost statistical significance ($\beta = 2.98$, 95% CI –0.29 to 6.24; $p = .07$) eTable S4; and (c) latent profile analysis (LPA) in Figure S1.

4 | DISCUSSION

Our hypothesis that unobserved classes of patients exist with respect to cancer-related symptoms was confirmed. LCA revealed that adolescents were classified into three previously unidentified groups: High Distress-25%; High Physical/Low Psychological Distress-14%; and Low Distress-62%. As hypothesized, class classification varied by gender–poverty combinations. Female adolescents living in households with incomes at or below the 2016 FPL had 30 times the odds of being classified in the High Distress class, compared to those in the High Physical/Low Psychological Distress class. This finding was also statistically significant, but not compared to those in Low Distress.

Intersectionality may prove important for understanding the specific challenges facing economically vulnerable adolescent females with cancer. However, our small sample size created a level of uncertainty about this finding, as evidenced by the wide confidence interval in the odds ratio. Similarly, in post hoc analysis when "on active treatment" was added to the model, female adolescents living in households below the 2016 FPL had 20 times the odds of *High Distress* compared to those in the *High Physical, Low Psychological Distress* class, but the confidence interval was wide and statistical significance disappeared. Thus, this study needs to be replicated with a larger sample. Future research should also examine the possible reasons for this finding. For example, are adolescent females living in poverty and not on active treatment, more likely than males in this situation, to provide family caregiving (e.g., taking care of siblings or ill family members, cooking), particularly considering symptoms of fatigue and pain interference, as has been found among adults?[7] If family caregiving is present, what may be beneficial or burdensome?[36]

Prior research on disparities in pediatric cancer outcomes indicated SES was a robust predictor of access to and quality of health care.[37] SES has also been shown to mediate the association between race/ethnicity and adolescent cancer survival.[38] Adolescents with cancer living in poverty are less likely to receive end-of-life cancer treatment than peers with higher incomes, but the reasons are unknown.[39] In a registry-based study disparities by cancer stage and SES worsened over time.[40]

This study offers methods for how to study gender and poverty interactions in cancer care delivery research. Findings may move the field of symptom management and patient-reported symptom science forward in two ways: (a) with respect to research, by highlighting the importance of LCA so that assumptions of homogeneity are tested to ensure valid interpretation of results; and (b) with respect to clinical care, by identifying "hidden" groups who may be experiencing the greatest symptom distress in need of palliation. Here, we tested the assumption that the study sample is homogenous, as traditional statistics make this assumption. LCA is a person-centered approach to the data rather than a variable-centered approach. Traditional moderator analysis of intervention results are variable-centered approaches. However, variable-centered and person-centered analytical approaches are often integrated in a more generalized analytical framework. As such, examining the influence of time insensitive variables such as gender, race, and income on symptom distress can be readily done after the unobserved latent classes/groups are identified.

Limitations of this study include its cross-sectional design. We were limited in our application of Intersectionality Theory with respect to the overlapping identities of race, class, and gender because of the lack of racial diversity in the sample. Results may not generalize beyond well-resourced tertiary pediatric hospitals with palliative care and psychosocial supports. We do not have data on household income for those who declined participation. Fewer males agreed to participate than females. Males who declined could have been more symptomatic or more at risk for psychological distress significantly biasing study outcomes. This was also true for capturing a sample of patients whose gender falls outside the gender binary who may experience poverty[41] and symptom distress differently. Males are less likely to participate in clinical trials of ACP generally.[42] Our enrollment rate may bias generalizability, but is comparable to adult longitudinal clinical trials involving palliative care.[43,44] Most of the study population was not diagnosed during adolescence. Applying the 2016 FPL to household income data collected in 2019 likely underestimated poverty. Social desirability bias could have occurred with face-to-face administration of study questionnaires. We chose this approach to enable monitoring of emotional reactions and to control for issues of literacy, impaired or uncorrected vision, item comprehension, and questionnaire completeness. There is no validation of the PROMIS Pediatric measures for cancer patients aged 18–20 years old. Approximately one-fourth of potentially eligible dyads declined to participate, because they did not want to talk about pACP. This is true of adults as well.[45] Talking about death and dying is taboo.[46] Some adolescents prefer to defer to their family or doctor. Some families believe it is their role alone to make these decisions. Other families believe pACP is against their religion or cultural norms,[47] "shocking" as one elder put it. Post hoc analysis has limitations, as discussed in Supporting Information.[48]

Future research needs to independently validate the three latent classes that emerged from these data in other adolescent samples, and to replicate the finding of health disparities with respect to gender and poverty interactions. Findings support policy recommendations for routine screening of patient-reported symptoms and psychosocial aspects of care to improve health equity and increase longevity.[49–58] Some systems are effectively doing this already.[59] The American Academy of Pediatrics has campaigned to encourage physicians to screen patients for social needs and has developed tools to help physicians.[60] The Centers for Medicare and Medicaid Services has prioritized screening for five social needs associated with medical outcomes and has also created a free screening tool.[61] In conclusion, adolescent females with cancer with households below the 2016 FPL had significantly greater odds of experiencing high symptom distress, compared to those with high physical but low psychological distress. More comprehensive screening and intervention, as needed, may decrease disparities.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

ACKNOWLEDGMENTS

CONFLICT OF INTEREST

DATA AVAILABILITY STATEMENT

Deidentified data that support the findings of this study are available upon request from the corresponding author.

Abbreviations:

ACP	advance care planning
FACE pACP	FAmily CEntered pediatric Advance Care Planning
FPL	Federal Poverty Level
LCA	latent class analysis
PROMIS	Patient-Reported Outcomes Measurement Information System
SES	socioeconomic status

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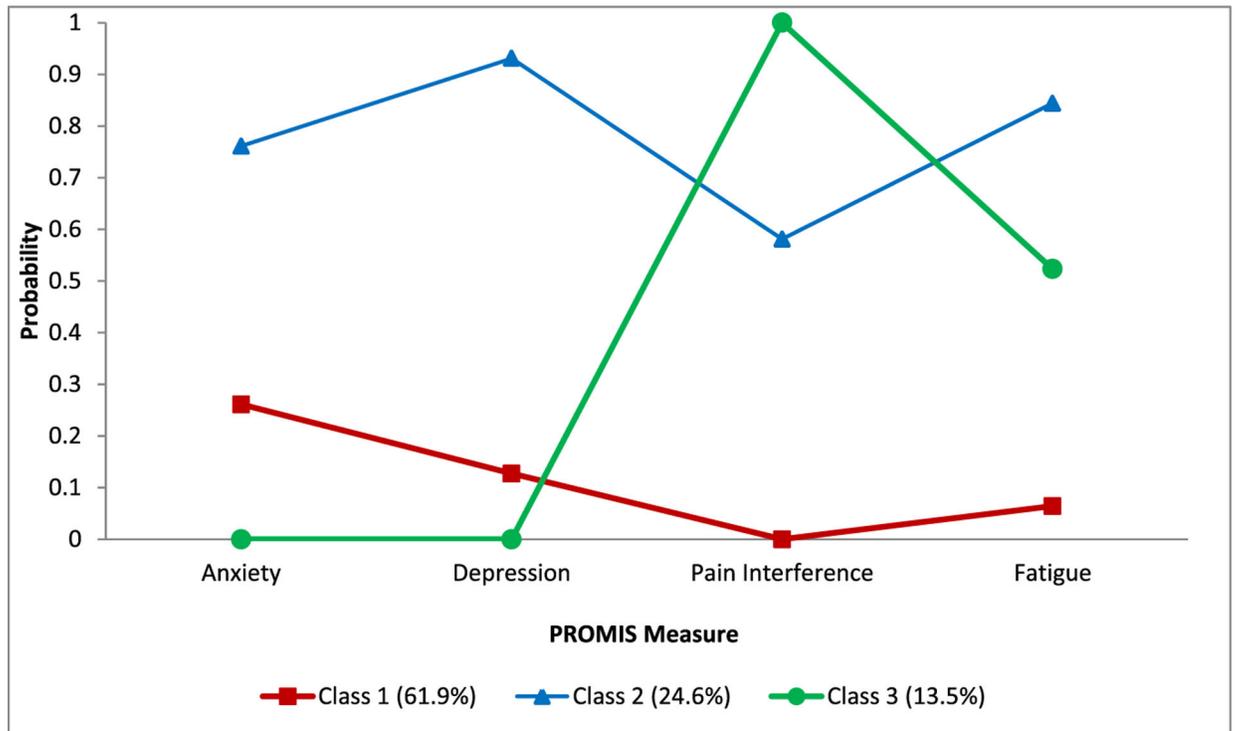
FIGURE 1.
Latent class analysis of four PROMIS measures ($N = 126$). Four dichotomized PROMIS measures (1: T-score >50; 0: T-score 50) were used in latent class analysis. Definitions: Class 1, Low Distress; Class 2, High Distress; Class 3, High Physical, Low Psychological Distress

TABLE 1

Demographics and characteristics for adolescents with cancer at baseline ($N = 126$)

Variable	Statistics
Age	
Mean (SD)	16.9 (1.9)
Range	(14, 20)
Age	**N (%)**
14–17	69 (54)
18–20	57 (45)
Self-identified gender	
Male	54 (42)
Female	72 (57)
Self-identified race	
Asian	3 (2)
Black or African American	17 (13)
White	100 (79)
More than one race	5 (4)
Declined	1 (0.8)
Self-identified ethnicity	
Not Hispanic or Latino	116 (92)
Hispanic or Latino	5 (4)
Declined	5 (4)
Diagnosis	
Leukemia	42 (34)
Lymphoma	18 (14)
Solid tumors	34 (27)
Brain tumor	25 (20)
Other	6 (5)
Household income by persons in family/household	
Equal to or below the 2016 FPL	33 (26)
101–200% of FPL	37 (29)
201–300% of FPL	19 (15)
>300% of FPL	33 (26)
Declined	4 (3)
Household income dichotomized as	
Equal to or below the 2016 FPL	33 (26)
101% of FPL	89 (71)
On active treatment	
Yes	27 (21)
No	99 (79)
Bone marrow transplant?	
None	108 (86.4)

Once	16 (12.8)
Twice	1 (0.8)
Relapse ever?	
No	110 (88.0)
Once	13 (10.4)
Twice	2 (1.6)

TABLE 2

PROMIS pediatric symptom measures, Short forms mean scores for different levels of gender and poverty status

PROMIS measures		Male with low income	Male with not low income	Female with low income	Female with not low income
Anxiety *T*-score	Mean (SD)	47.53 (6.89)	45.49 (8.50)	47.71 (11.13)	47.13 (9.72)
Depression symptoms *T*-score	Mean (SD)	43.83 (8.60)	43.92 (9.60)	46.80 (10.99)	45.62 (10.23)
Pain interference *T*-score	Mean (SD)	46.08 (12.03)	40.42 (7.77)	51.01 (11.29)	43.51 (10.14)
Fatigue *T*-score	Mean (SD)	46.73 (13.05)	42.18 (11.85)	50.51 (13.13)	45.67 (12.34)

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TABLE 3

Selected results of multinomial logit model: Testing effect of gender and poverty interaction on latent class classification ($N = 121$)[a]

Predictor	PROMIS latent class					
	Class 1 versus Class 3		Class 2 versus Class 3		Class 2 versus Class 1	
	AOR	95% CI	AOR	95% CI	AOR	95% CI
Female	0.24	0.05, 1.26	0.28	0.05, 1.77	1.17	0.40, 3.42
Poverty	0.21	0.03, 1.49	0.11	0.01, 1.73	0.52	0.05, 4.85
Female and poverty	2.83	0.24, 33.45	30.27	1.23, 735.10	10.70	0.82, 138.38
Young (14–17 years)	0.88	0.28, 2.77	0.36	0.10, 1.35	0.41	0.16, 1.06
White	2.14	0.63, 7.32	2.56	0.58, 11.13	1.19	0.35, 4.06

Abbreviations: AOR, adjusted odds ratio; CI, confidence interval; Class 1, Low Distress; Class 2, High Distress; Class 3, High Physical/Low Psychological Distress.

[a]Participants with missing information on race and household income were excluded.

TABLE 4

Multinomial logit model for PROMIS pediatric symptom measures, Short forms, latent class analysis to test the interaction of gender and poverty ($N =$ 121) [a]

PROMIS Latent Class

Predictor	Class 1 versus Class 3		Class 2 versus Class 3		Class 2 versus Class 1	
	β (95% CI)	p-Value	β (95% CI)	p-Value	β (95% CI)	p-Value
Female	−1.41 (−3.05, 0.23)	.09	−1.26 (−3.09, 0.57)	.18	.16 (−0.92, 1.23)	.78
Poverty	−1.58 (−3.56, 0.40)	.12	−2.24 (−5.03, 0.55)	.12	−.66 (−2.91, 1.58)	.56
Female and poverty	1.04 (−1.42, 3.51)	.41	3.41 (0.21, 6.60)	.04	2.37 (−0.20, 4.93)	.07
Young (14–17 years)	−.13 (−1.29, 1.02)	.82	−1.02 (−2.34, 0.30)	.13	−.89 (−1.84, 0.06)	.07
White	.76 (−0.47, 1.99)	.22	.94 (−0.54, 2.41)	.21	.17 (−1.05, 1.40)	.78

Abbreviations: CI, confidence interval; Class 1, Low Distress; Class 2, High Distress; Class 3, High Physical/Low Psychological Distress.

[a] One adolescent declined to report race and four families declined to report household income and were excluded.