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## Problem-Solving Skills, Parent-Adolescent Communication, Dyadic Functioning, and Distress Among Adolescents with Cancer

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### Abstract

Some adolescents with cancer report distress and unmet needs. Guided by the disability-stress-coping model, we evaluated associations among problem-solving skills, parent-adolescent cancer-related communication, parent-adolescent dyadic functioning, and distress in adolescents with cancer. Thirty-nine adolescent-parent dyads completed measures of these constructs. Adolescents were 14–20 years old and on treatment or within one year of completing treatment. Better problem-solving skills were correlated with lower adolescent distress ( $r = -0.70, p < 0.001$ ). Adolescent-reported cancer-related communication problems and dyadic functioning were not significantly related to adolescent distress ( $r_s < 0.18$ ). Future work should examine use of problem-solving interventions to decrease distress for adolescents with cancer.

### Keywords

problem-solving; adolescents; dyadic function; cancer-related communication; positive coping

### Introduction

Adolescence is a developmental period characterized by significant physical, cognitive, social, and emotional changes. Cancer during adolescence is stressful and challenging for families, because it interferes with development of independence and autonomy needed for successful transition to young adulthood.<sup>1</sup> Despite unique developmental challenges, adolescents and young adults (AYAs) are not always distinguished from younger children or adults in research or in clinical care.<sup>2</sup>

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### Conflict of Interest

The authors declare that there is no conflict of interest

While the broader pediatric literature finds that the majority of patients demonstrate psychological resiliency following cancer diagnosis,<sup>3</sup> the literature on AYA patients is less clear.<sup>4</sup> Recent work suggests that more than half of AYA patients demonstrate resiliency throughout the year following diagnosis, but 35% report clinically elevated distress at some point during that time.<sup>5</sup> Further, many AYA patients and survivors report unmet information and psychosocial needs.<sup>2,5</sup> Better understanding of correlates of distress can lead to new developmentally appropriate strategies to help AYA patients adjust.

The disability-stress-coping model posits that adolescent adjustment is influenced by risk and resilience factors, including intrapersonal (e.g., problem-solving ability), social-ecological (e.g., family environment, social support, and parental adjustment), and stress-processing factors (e.g., coping strategies and cognitive appraisal).<sup>6</sup> Research on problem-solving ability has generally focused on parents. The Psychosocial Standards of Care recommend Problem-Solving Skills Training (PSST) as an evidence-based intervention for caregivers of children with cancer.<sup>7</sup> However, problem-solving ability has not been thoroughly examined in adolescents. A study of child and adolescent cancer patients found depressive attributional style and avoidant coping predicted poorer adjustment.<sup>8</sup> In healthy adolescents, a positive problem-solving orientation (i.e., general disposition to appraise problems as solvable with positive outcome expectancies) is associated with lower depression.<sup>9</sup> Research on social-ecological factors affecting adjustment finds that parental support and optimal family functioning (cohesion, flexibility, low conflict, communication) are critical for positive adjustment;<sup>10</sup> however, communication around cancer care is challenging for adolescents, parents, and the medical team.<sup>11</sup>

Given that few studies have focused on adolescent problem solving, this study aimed to describe and assess how intrapersonal (i.e., problem-solving ability) and social-ecological factors (i.e., cancer-related communication with parents and parent-adolescent dyadic relationship quality) are associated with adolescent adjustment (i.e., distress). Using the disability-stress-coping model, we hypothesized that better problem-solving skills, cancer-related communication, and dyadic relationship quality would be associated with lower adolescent distress. We also explored parent-adolescent agreement in reporting these constructs.

## Methods

This analysis was part of a mixed-methods study conducted at two regional childhood cancer centers following local IRB approval. Eligible families were English-speaking with an adolescent, 13–20 years old, currently on or within 1 year of completing cancer treatment. We limited enrollment to this age range to focus on AYA likely to have a parent involved in their care and gather the perspectives of both AYA and their parents. Families were recruited in clinic or by mail and phone. After providing informed consent/assent, parents provided demographic information, and adolescents and parents completed questionnaires.

Problem-solving orientation was measured using the Social Problem-Solving Inventory-Revised (SPSI-R), a 52-item survey that yields 5 subscales and a summary score.<sup>12</sup> The summary SPSI-R score indicates global social problem-solving ability, with higher scores

indicating better skills.<sup>12</sup> Adolescents ( $\alpha=0.92$ ) and parents ( $\alpha=0.88$ ) reported on their own problem-solving skills. Cancer-related communication was measured using an adapted version of the Cancer-Related Communication Problems Scale (CRCP), a 15-item index developed to measure cancer-related communication problems between adult cancer patients and spouses.<sup>13</sup> For this study, the item “I don’t talk with my partner about how cancer affects me sexually,” was eliminated and the word parent/child was substituted for partner. The mean rating represents the average degree of communication problems, with higher scores indicating greater problems. As an index of problems, the internal consistency is not expected to be high (adolescent  $\alpha=0.69$ ; parent  $\alpha=0.61$ ). Dyadic functioning was assessed using the Brief Family Assessment Measure-III (FAM-III): Dyadic Relationship Scale,<sup>14</sup> a valid and reliable 14-item measure of relationship quality (adolescent  $\alpha=0.90$ ; parent  $\alpha=0.85$ ). It yields a summary T-score ( $M=50$ ,  $SD=10$ ), with higher scores indicating poorer family functioning and T-scores  $>60$  considered clinically elevated. The Global Severity Index of the Brief Symptom Inventory (BSI), a well-validated 53-item psychological symptom measure,<sup>15</sup> provided a measure of overall adolescent distress ( $\alpha=0.95$ ). T-scores  $>63$  indicate clinically significant distress.<sup>15</sup>

Descriptive statistics (frequencies, means, standard deviations) were used to describe the sample. Missing items (0.4%) were imputed with mean values for any scale with  $>75\%$  of items completed. Pearson correlations examined associations between measures and within-dyads. Dependent t-tests were used to examine within-dyad differences.

## Results

### Participants

Participants were 39 adolescent-parent pairs. One parent did not complete the CRCP and was excluded from analyses with that outcome only. Adolescents were an average age of 16.1 years ( $SD=1.6$ , range 14–20) and 69.2% were male. Participants were an average of 14.1 months (range: 1–43) post diagnosis, and nearly 80% were still receiving treatment ( $n=31$ ). Per self-report, 82.1% were Caucasian, 12.8% African American, and 5.1% Asian. Diagnoses included blood cancers (51.3%), solid tumors (35.9%), and brain tumors (12.8%). The parent sample was 79.5% mothers with the same racial distribution as adolescents. No statistically significant differences were found across families related to parent gender.

### Descriptives

Table 1 shows adolescent and parent outcomes. Adolescents reported distress within the normal range ( $M=46.9$ ,  $SD=9.2$ ); only one adolescent had a clinically elevated score. Adolescent and parent report of dyadic function was also within normal range; three adolescents and zero parents had clinically elevated scores.

### Associations among measures

Better adolescent problem-solving skills ( $r=-0.70$ ,  $p<0.001$ ) and better parent problem-solving skills ( $r=-0.43$ ,  $p=0.01$ ) were associated with lower adolescent distress. Neither adolescent nor parent-reported cancer-related communication problems or dyadic functioning was significantly associated with adolescent distress (Table 2). There were no

significant differences by age ( $r_s=-0.29-0.17$ ), treatment status ( $t_s=0.29-1.33$ ), or time since diagnosis ( $r_s=-0.16-0.09$ ) for any of the outcomes.

### Within-dyad associations

Parents and adolescents reported similar moderate levels of cancer-related communication problems (2.41 and 2.26, respectively,  $t(38)=-0.84$ ,  $p=0.41$ ). The most commonly endorsed cancer-related problem was “not talking about what to do if the adolescent should get significantly worse.” Modest correlations were found between parent and adolescent reports of problem-solving ability ( $r=0.33$ ,  $p=0.06$ ), cancer-related communication problems ( $r=0.39$ ,  $p=0.01$ ), and dyadic functioning ( $r=0.30$ ,  $p=0.07$ ). Parents reported better problem-solving ability ( $t[37]=3.23$ ,  $p=0.003$ ) and better dyadic functioning ( $t[38]=2.79$ ,  $p=0.008$ ) than their adolescent (Table 1).

### Discussion

Consistent with the disability-stress-coping model, this study found better adolescent problem-solving ability was associated with fewer adolescent-reported cancer-related communication problems, better adolescent-reported dyadic functioning, and less adolescent distress after cancer diagnosis. Correlations were small to moderate with the exception of a strong inverse relationship between problem-solving ability and distress. Surprisingly, adolescent distress was not significantly correlated with dyadic relationship or cancer-related communication problems. This may be due to the low rate of clinical distress in our sample, consistent with other studies of adolescents with cancer,<sup>5,16,17</sup> which may have reduced associations. These results also suggest that other factors are more relevant to adolescent distress. Future research could investigate the impact of parental distress, overall family functioning, or other developmentally-relevant proximal factors such as peer support. Despite low levels of clinical distress in our sample, a growing body of research has highlighted the psychological impact of cancer on adolescents,<sup>18</sup> with skill-based interventions (such as problem-solving skills training) potentially mitigating this impact.<sup>19</sup>

Parents and adolescents reported similar, moderate levels of cancer-related communication problems. Parent and adolescent problem-solving ability also demonstrated small positive correlations, consistent with research showing how parent modeling and parenting style influence child development including problem-solving ability.<sup>20</sup> Interventions to promote problem-solving skills have been shown to improve depression, anxiety, and distress in parents of children undergoing cancer treatment,<sup>21</sup> and might benefit parent-adolescent dyads in this context.<sup>22</sup> Better problem-solving may improve parent-adolescent relationships and communication, as demonstrated in other disease populations.<sup>23,24</sup> Problem-solving skills may be considered a type of primary control coping aimed at changing one’s environment, while other skills (e.g., cognitive restructuring, relaxation) may be considered secondary control coping skills aimed at changing one’s emotions.<sup>25</sup> The broader literature on coping among adolescents with cancer suggests that different types of coping strategies may be beneficial, and problem-solving skills represent one way in which to increase positive coping strategies and adjustment in adolescents with cancer.<sup>26,27</sup>

Limitations of the study included small sample size, descriptive approach, and cross-sectional design. Additionally, our population was a convenience sample of those recently diagnosed at two regional cancer centers, potentially limiting generalization. Given the lack of validated parent-adolescent cancer-related communication measures, the CRCP was adapted for use but may not fully capture communication issues experienced by these dyads. This is an area needing further research.

In conclusion, while levels of distress were within normal limits in our sample, problem-solving skills are modifiable targets for intervention that could promote healthy coping with cancer and help adolescents successfully reintegrate into normal developmental tasks. As healthcare teams implement psychosocial assessment as a standard of care,<sup>28</sup> adolescent problem-solving skills are relevant to consider. Future studies with larger populations are warranted to replicate these findings and determine the effect of a problem-solving intervention on adolescent distress, parent-adolescent communication, and dyadic functioning.

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## Abbreviation Item

<b>AYA</b>	Adolescent and Young Adult
<b>PSST</b>	Problem-Solving Skills Training
<b>SPSI-R</b>	Social Problem-Solving Inventory-Revised
<b>CRCP</b>	Cancer-Related Communication Problems Scale
<b>FAM-III</b>	Family Assessment Measure-III
<b>BSI</b>	Brief Symptom Inventory

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**TABLE 1**

Descriptives of outcomes and within-dyad differences.

	Adolescent <i>M (SD)</i>	Parent <i>M (SD)</i>	Mean Difference [95% CI]
Summary Problem Solving Ability	13.2 (2.5)	14.9 (1.9)	-1.52 [-2.33, -0.55]**
Cancer-related Communication Problems (CRCP)	2.36 (0.51)	2.26 (0.60)	0.08 (-0.12, 0.29)
Dyadic Adjustment (FAM-III) T-score	47.7 (9.8)	42.8 (7.3)	4.64 (1.27, 8.01)**
BSI- Global Severity Index T-score	46.9 (9.2)	-----	-----

Note: Summary Problem-Solving Ability range of scores: 5.98–16.29 (adolescent), 10.27–18.96 (parent); CRCP range of scores 1.14–3.29 (adolescent), 1.00–3.50 (parent); FAM-III range of (T) scores: 30.0–78.0 (adolescent), 32.0–62.0 (parent); BSI range of scores: 25.0–74.0 (adolescent).

\*  
 $p < 0.05$

\*\*  
 $p < 0.01$



**TABLE 2**

Correlations among Problem-Solving, Cancer-related Communication Problems, Dyadic Adjustment and Adolescent Distress

	Adolescent Summary Problem Solving Ability	Adolescent CRCP	Adolescent FAM-III	Adolescent Distress <sup>a</sup>
Adolescent Summary Problem Solving Ability	---	-0.34 *	-0.35 *	-0.70 **
Adolescent Cancer-related Communication Problems (CRCP)		---	0.54 **	0.18
Adolescent Dyadic Adjustment (FAM-III)			---	0.17
Parent Summary Problem Solving Ability	0.33	-0.01	0.10	-0.43 *
Parent Cancer-related Communication Problems (CRCP)	-0.16	0.39 *	0.11	-0.05
Parent Dyadic Adjustment (FAM-III)	-0.34 *	0.30	0.30	0.19

Note. N=39 dyads;

<sup>a</sup>Distress was reported only by adolescent and *n*= 38 due to exclusion of one outlier.

\* *p* 0.05

\*\* *p*<0.001