Coping and Participation in Youth With Spinal Cord Injury

Jennifer J. Lindwall, PhD,[1] Heather F. Russell, PhD,[2] Erin H. Kelly, PhD,[3,4] Sara J. Klaas, MSW, C-ASWCM,[5] Mary Jane Mulcahey, OTR/L, PhD,[6] Randal R. Betz, MD,[2] and Lawrence C. Vogel, MD[3,7]

[1]Department of Psychology, St. Jude Children's Research Hospital, Memphis, Tennessee; [2]Shriners Hospitals for Children, Philadelphia, Pennsylvania; [3]Shriners Hospitals for Children, Chicago, Illinois; [4]Department of Disability and Human Development, University of Illinois, Chicago, Illinois; [5]Spinal Cord Injury Service, Shriners Hospitals for Children, Chicago, Illinois; [6]Department of Clinical Research, Shriners Hospitals for Children, Philadelphia, Pennsylvania; [7]Rush Medical College, Chicago, Illinois

Background: Coping and participation are important adjustment outcomes of youth with spinal cord injury (SCI). Research addressing how these outcomes are related is limited. **Objective:** This cross-sectional study examined relationships between coping and participation in youth with SCI. **Method:** Youth ages 7 to 18 years were recruited from 3 hospitals specializing in rehabilitation of youth with SCI. The Kidcope assessed coping strategies, and the Children's Assessment of Participation and Enjoyment (CAPE) examined participation patterns. Point biserial and Pearson correlations assessed relationships among variables, and hierarchical multiple regression analyses examined whether coping significantly contributed to participation above and beyond significant demographic and injury-related factors. **Results:** The sample included 294 participants: 45% female, 65% Caucasian, 67% with paraplegia. Mean age was 13.71 years (*SD* = 3.46), and mean duration of injury was 5.39 years (*SD* = 4.49). Results indicated that higher levels of social support and lower levels of self-criticism predicted higher participation in informal activities, lower levels of social withdrawal predicted participation in informal activities with a greater diversity of individuals, lower levels of blaming others predicted higher enjoyment of informal activities, and higher levels of cognitive restructuring predicted participation in formal activities with a greater diversity of individuals and in settings further from home. **Conclusion:** Results suggest higher levels of social support and cognitive restructuring and lower levels of self-criticism, social withdrawal, and blaming others predicted favorable participation outcomes. Interventions for youth with SCI that encourage higher levels of positive coping strategies and lower levels of negative and avoidant strategies may promote positive participation outcomes. **Key words:** *coping, participation, spinal cord injury (SCI), youth*

Youth with chronic physical health issues and/or disabilities can experience disruptions in their physical functioning and social-emotional development. One of these chronic physical disabilities is pediatric spinal cord injury (SCI), which can include partial or complete paralysis.[1] Children who sustain SCI typically face a number of medical issues, including chronic pain, bladder and bowel problems, greater vulnerability to respiratory and heart difficulties,[1] growth problems, and potential scoliosis.[2] SCI can also influence overall psychological well-being and can include feelings of grief and loss[3] or general emotional distress resulting from the trauma of the injury, hospitalization, or adjustment difficulties related to self-identity, sexual health, and self-control.[4]

Given the potential psychological distress that can affect an individual's daily functioning following a physical injury,[5] it is important to consider how youth with SCI cope. To date, there is a lack of research examining this topic. Findings on the relationship between coping and adjustment in other pediatric populations have been mixed and are complicated by the use of disparate definitions of coping and different measurement strategies.[6-8] Some studies suggest that certain maladaptive coping strategies are associated with negative outcomes. For example, avoidant coping (ie, distancing one's self from the stressor without addressing it) has been reported to negatively predict psychological functioning in 8- to 15-year-old children diagnosed with asthma[9] and increased symptoms of depression, anxiety, and distress in 7- to 18-year-old cancer patients.[10]

Top Spinal Cord Inj Rehabil 2012;18(3):220–231
© 2012 Thomas Land Publishers, Inc.
www.thomasland.com

doi: 10.1310/sci1803-220

Other findings suggest that increased use of certain adaptive strategies is associated with positive outcomes. For example, use of positive reappraisal and information-seeking coping is reported as being associated with reports of increased quality of life in 12- to 16-year-old children with asthma.[11] In a sample of adolescent patients (11-18 years old) with cancer, use of engagement, active, and adaptive coping strategies (particularly cognitive restructuring) were associated with decreased levels of internalizing and externalizing symptoms.[12] Religious coping has also been reported as predicting decreased posttraumatic stress symptoms in children and adolescents at 1 year following an injury or diagnosis of a chronic medical issue.[8]

Despite the aforementioned findings, other research has found mixed results associated with coping strategies. Zehnder et al[8] assessed the coping strategies and psychosocial functioning of youth 6 to 15 years old following a physical injury or a diagnosis of a chronic medical issue. Results suggested that active coping at baseline (5-6 weeks following hospital admission) predicted increased internalizing and externalizing problems as well as increased posttraumatic stress at 1-year follow-up. These findings are in contrast to the research described previously that suggests active coping as an adaptive strategy associated with positive, rather than negative, outcomes.[11,12] Furthermore, coping strategies that are significantly associated with adjustment outcomes in other research (ie, social support, distraction, avoidance) did not significantly predict psychosocial functioning at 1 year for this population of youth.

Although this literature provides some information about the relationship between coping and adjustment among youth with physical disabilities like SCI, the somewhat contradictory findings, particularly related to typically regarded "adaptive" coping, highlight the need for further research. One particular outcome that warrants attention is participation.[13-15] Participation has been suggested as an important indicator of overall health[13] and a critical domain that facilitates social-emotional development during childhood and adolescence.[16] Participation has been associated with important adjustment outcomes such as community integration and quality of life among individuals with SCI.[17] Research suggests that children and adolescents with disabilities participate in fewer activities overall and at a less frequent rate than their peers,[13] putting them at risk for social withdrawal and isolation.[18] Furthermore, the activities in which youth with disabilities participate are primarily informal (ie, spontaneous activities with few rules and/or little planning, such as reading or talking on the phone) rather than formal (ie, activities with established rules, organization, and leaders, such as music lessons or team sports). When participating in formal activities, youth with disabilities report less enjoyment than their peers without disabilities.[19] In a sample of youth with SCI, comparable results were reported: Youth with SCI engaged in primarily informal activities and reported greater enjoyment related to participation in informal rather than formal activities.[14] One result of having limited participation is that youth with disabilities may experience limited opportunities to interact with peers, which is critical to positive social development.[20-22] Therefore, it is important not only to examine general patterns of participation, but also to consider ways in which participation promotes social engagement with others and in multiple settings.

Both coping and participation appear to be critical to the rehabilitation of youth with SCI. Therefore, the goal of the current study was to examine the relationship between coping and participation in both informal and formal activities. Due to limited research available on this topic, exploratory hypotheses were generated to guide data analysis. More specifically, it was hypothesized that (a) higher levels of positive coping strategies and (b) lower levels of negative and avoidant coping strategies will be associated with more favorable participation outcomes, including increased participation and enjoyment and participating with others and in settings away from home. Given that previous studies have suggested that youth with SCI participate in more informal than formal activities,[14] it was anticipated that predicted relationships would be particularly strong in the informal participation domain.

Method

Participants

Participants were involved in a larger research study exploring coping, participation, emotional functioning, and quality of life among youth with SCI. Children included in the current study (1) were between the ages of 7 and 18 years; (2) had SCI for 1 year or more; (3) spoke English; (4) did not have any significant cognitive impairments; and (5) were engaged in treatment at 1 of 3 SCI hospitals within 1 hospital system.

Instruments

Family demographic information form. This form was completed by the child's parent/caregiver and gathered information about various child and caregiver demographic variables, including child sex and race and caregiver education.

Medical chart review form. This form gathered specific medical information relevant to the child's injury and was completed by a research assistant. For the analyses that are reported here, the following demographic variables were considered: current age, age at time of SCI, and level of injury (paraplegia vs tetraplegia).

Kidcope. The Kidcope[23] is a self-report instrument that examines coping strategies used by youth after experiencing a negative event. This measure is based on the theoretical premise of coping as conceptualized by Lazarus and Folkman.[24] Spirito et al[23] conceptually grouped 10 coping strategies into 3 categories: active (problem-solving, emotional regulation, cognitive restructuring, and social support), negative (self-criticism and blaming others), and avoidant (distraction, social withdrawal, wishful thinking, and resignation). On this measure, participants are asked to indicate whether they use a given coping strategy, and, if so, how often they use each strategy (which results in a "how often" or overall frequency variable). In preparation for data analyses, responses from the older version (for youth ages 13-18) were collapsed into the dichotomous scale of the younger version (for youth ages 7-12) in order to analyze the responses from all youth simultaneously.[25] For the purposes of this study, participants were asked to complete the questionnaire while thinking about having to cope with their SCI (ie, the identified stressor). Research has reported adequate test-retest reliability and the validity of the Kidcope.[23] An overall measure of internal consistency was not assessed for the present sample because the Kidcope represents a multidimensional scale.[25]

Children's Assessment of Participation and Enjoyment (CAPE). The CAPE[26] explores engagement in both formal (eg, playing team sports, taking singing or music lessons, going on an outing) and informal activities (eg, playing board or card games, talking on the phone, reading) within various settings such as the home, school (outside of class time), and community. This measure can be used by 6- to 21-year-old individuals with and without physical disabilities. Each of the 55 activities is assessed according to 5 dimensions: diversity (whether the child has engaged in the activity in the past 4 months); intensity (how often the child has engaged in the activity in the past 4 months); with whom (individuals with whom the participant engages in the activity); where (the location where the participant engages in the activity); and enjoyment (the level of enjoyment experienced while engaging in the activity). For those activities in which the child participates, he/she indicates (a) whether he/she engages in the activity (yes/no); (b) how often he/she engages in the activity (ranging from "1 time in the past 4 months" to "1 time a day or more"); (c) with whom he/she engages in the activity (ranging from "alone" to "with others"); (d) where he/she participates in the activity (ranging from "home" to "beyond your community"); and (e) how much he/she enjoys the activity (ranging from "not at all" to "love it"). Test-retest reliability for the CAPE has been reported as ranging from 0.64 to 0.86 for the formal, informal, and total participation intensity scores.[19]

Procedures

Participants were recruited during routine visits to 1 of the 3 hospitals involved in the study. A parent and his/her child/adolescent were

approached by a member of the research staff, were given a brief overview of the study, and were invited to participate. Assistance was provided for those participants who needed support to complete the questionnaires (eg, assistance reading items or writing answers).

Data analyses

First, point biserial, and Pearson correlation coefficients were used to assess the relationships between demographic factors (current age, gender, caregiver education), injury-related variables (level of injury, age at injury, time since injury), individual coping strategies, and participation variables. Regarding coping, the frequency variables for each of the 10 individual strategies included in the Kidcope were examined. In terms of participation, it was determined that outcomes would be examined separately for informal and formal participation given that previous research has reported that children with disabilities,[13] and more specifically children with SCI,[14] participate in informal activities at a significantly higher rate than formal activities. Four continuous participation variables were examined for informal activities and 4 for formal activities: (1) participation frequency (a composite variable was created by multiplying diversity and intensity scores due to the high correlation between these 2 variables[14]), (2) with whom, (3) where, and (4) enjoyment. Higher scores on each of these variables represented greater frequency of participation; participating with a broader group, away from immediate family; participating further from home; and greater participation enjoyment.

Next, those participation variables that had significant univariate relationships with coping strategies were included in hierarchical multiple regression analyses as dependent variables in order to examine whether coping strategies significantly contribute to patterns of participation above and beyond significant demographic and injury-related factors. In total, 6 of the 8 participation variables (informal frequency, informal with whom, informal where, informal enjoyment, formal with whom, and formal where) were significantly related to coping strategies, resulting in 6 hierarchical regression analyses. The 4 informal participation variables were significantly correlated with both age at injury and age at interview. Because these 2 variables were highly correlated themselves ($r = .644$, $P < .01$), both variables could not be included as individual predictors in the same regression equation. Age at interview was chosen over age at injury, because it had a slightly higher correlation with the outcome variables. Preliminary analyses determined that informal frequency, informal where, and formal with whom were not normally distributed and therefore were subjected to a log transformation prior to regression analyses.

Results

The sample consisted of 294 pediatric participants with a mean age of 13.71 years ($SD = 3.46$) at time of interview. Forty-five percent of participants were female, and 65% were Caucasian. Age at time of injury ranged from 0 to 17 years (mean = 8.35, $SD = 5.81$), and time since injury ranged from 1 to 18 years (mean = 5.39, $SD = 4.49$). Regarding injury level, 67% of participants had paraplegia while the remaining 33% had tetraplegia. Of those participants who indicated level of mobility (n = 250), 6% of participants walk independently, 8% walk with assistance, and 71% use a wheelchair. Sixty-three percent of caregivers reported having at least some education beyond high school, 23% had a high school diploma, and 14% of caregivers had not obtained a high school degree (see **Table 1** for these results). For additional descriptive data on this population, please refer to Dasch et al[27] for a discussion of coping and to Klaas et al[14] for a review of participation.

Univariate relationships between coping strategies and participation outcomes

Univariate relationships between participation outcomes and coping strategies were examined within both participation domains. As mentioned previously, 6 participation outcomes were significantly related to at least 1 coping strategy: informal frequency, informal with whom, informal where, informal enjoyment, formal with whom, and formal where. Regarding the informal domain, first, higher levels of social support and

Table 1. Characteristics of participant sample (n = 294)

Demographic variable	Percentage of sample
Sex	
Male	55%
Female	45%
Race	
Caucasian	65%
Spanish Origin	21%
African American	6%
Asian	2%
American Indian	1%
Other	5%
Caregiver education	
Some elementary	6%
Some elementary or junior high	3%
Some high school	5%
High school graduate	23%
Some college	24%
Associate/technical degree	18%
Bachelor's degree	15%
Graduate degree	6%
Mean age at interview, years (*SD*)	13.71 (3.46)
Mean age at time of injury, years (*SD*)	8.35 (5.81)
Mean time since injury, years (*SD*)	5.39 (4.49)
Level of injury	
Paraplegia	67%
Tetraplegia	33%
Level of mobility	
Walk independently	6%
Walk with assistance	8%
Use a wheelchair	71%

lower levels of self-criticism were associated with increased *informal participation frequency*. Second, higher levels of problem solving, higher levels of resignation, lower levels of social withdrawal, and lower levels of wishful thinking were associated with participating with a more diverse group of individuals (*informal with whom)*. Third, higher levels of resignation were related to participating further from home (*informal where*). Finally, higher levels of social support and lower levels of blaming others were associated with higher levels of enjoyment of informal activities (*informal enjoyment)*. Regarding the formal participation domain, higher levels of cognitive restructuring and lower levels of social withdrawal were related to participating with a more diverse group of individuals (*formal with whom*). Furthermore, higher levels of cognitive restructuring were associated with participating further from home (*formal where*). Frequency of participation and enjoyment in formal activities were not associated with any of the coping variables (see **Table 2** for these results).

Predicting participation from coping

Each of the 6 participation variables was then included in a hierarchical linear regression model as the dependent variable, with significantly related demographic variables and coping strategies as predictors.

Informal participation frequency. The first equation included informal participation frequency as the dependent variable. To assess the predictive value of coping in determining informal frequency, the significant demographic and injury-related variables were entered into step 1 of the regression analysis (age, gender, caregiver education, and level of injury), and significant coping strategies into step 2 (social support and self-criticism). Results indicated that use of self-criticism and social support accounted for 23% of the variance in informal participation frequency (R^2 = .232; **Table 3**).

Informal with whom. To examine the predictive value of coping in determining the diversity of individuals with whom youth participate in informal activities (informal with whom), the significant demographic variable (age) was entered into step 1 of the regression analysis and significant coping strategies were entered into step 2 (wishful thinking, problem-solving, resignation, and social withdrawal). Results demonstrated that social withdrawal contributed to 11% of the variance in the informal with whom participation variable (R^2 = .111; **Table 4**).

Informal where. The third equation examined the predictive value of coping in determining the context in which youth participated in informal activities (informal where). Significant demographic and injury-related variables were entered into the step 1 of the regression (age) and

Table 2. Point biserial and Pearson correlations between participation variables and coping strategies, demographic factors, and injury-related variables

	Informal Div x Int	Informal whom	Informal where	Informal enjoyment	Formal Div x Int	Formal whom	Formal where	Formal enjoyment
Demographic factors								
Age	-.383**	.288**	.219**	-.129*	-.164*	.133*	.122	-.088
Sex[a]	.237**	-.069	-.144	.211**	-.011	.113	-.039	-.005
Caregiver education	.141*	-.011	.047	.054	.167*	.025	-.029	.125
Injury-related factors								
Age at injury	-.237**	.226**	.194**	-.127*	-.117	.045	-.005	-.028
Level of injury[b]	.235**	-.072	-.104	-.092	.123	.006	-.028	.048
Coping strategies								
Cognitive restructuring	.077	.072	.015	.079	-.078	.245**	.141*	-.101
Wishful thinking	.020	-.152*	-.104	-.037	.019	-.097	-.098	-.026
Distraction	.005	-.104	-.089	-.010	-.001	-.054	-.069	-.063
Emotional regulation	.030	-.072	-.051	-.016	.031	-.041	-.020	-.103
Social support	.232**	-.056	-.111	.127*	.013	-.052	-.023	.010
Problem solving	-.012	.119*	.103	.086	-.089	-.002	-.028	-.008
Resignation	-.132	.142*	.136*	-.078	.018	.078	.042	-.038
Social withdrawal	-.062	-.127*	-.047	-.103	.016	-.139*	-.121	-.099
Self-criticism	-.165*	.110	.048	-.093	-.050	-.064	-.004	-.085
Blaming others	-.070	.051	.114	-.150*	.116	-.072	-.049	-.016

Note: Div x Int = Diversity x Intensity.
[a]Male=0; Female=1.
[b]Tetraplegia=0; Paraplegia=1.
*$P < .05$. **$P < .01$.

Table 3. Results of hierarchical regression analysis predicting "informal frequency participation" (n = 200)

Variable	B	SE B	β
Step 1			
Sex[a]	.090	.031	.188**
Level of injury[b]	.084	.035	.158*
Caregiver education	.016	.009	.111
Age at interview	-.021	.005	-.293**
Step 2			
Sex[a]	.076	.031	.159*
Level of injury[b]	.074	.034	.140*
Caregiver ed	.012	.009	.087
Age at interview	-.017	.005	-.242***
Self-criticis	-.068	.034	-.135*
Social support	.105	.035	.198**

Note: R^2 =.187 for step 1; ΔR^2= .209** for step 2.
[a]Male=0; Female=1.
[b]Tetraplegia=0; Paraplegia=1.
*P < .05. **P < .01. ***P < .001.

Table 4. Results of hierarchical regression analysis predicting "informal with whom" (n =281)

Variable	B	SE B	β
Step 1			
Age at interview	.043	.009	.281***
Step 2			
Age at interview	.035	.010	.231**
Social withdrawal	-.141	.062	-.133*
Wishful thinking	-.110	.088	-.076
Problem solving	.111	.067	.096
Resignation	.052	.070	.047

Note: R^2 =.079 for step 1; ΔR^2= .032* for step 2.
[a]Male=0; Female=1.
*P < .05. **P < .01. ***P < .001.

Table 5. Results of hierarchical regression analysis predicting "informal where" (n = 281)

Variable	B	SE B	β
Step 1			
Age at interview	.005	.001	.203**
Step 2			
Age at interview	.004	.002	.186**
Resignation	.007	.011	.041

Note: R^2 =.041 for step 1; ΔR^2= .001 for step 2.
*P < .05. **P < .01.

the one significant coping strategy (resignation) was included in step 2. After taking into account demographic and injury-related factors, use of resignation did not significantly contribute to where youth participate in informal activities (R^2 = .043; **Table 5**).

Informal enjoyment. To examine the predictive value of coping in determining the level of enjoyment when participating in informal activities (not at all, somewhat, pretty much, very much, love it), significant demographic and injury-related variables were entered into step 1 of the regression (sex and age), while significant coping strategies were included in the step 2 (social support and blaming others). Results demonstrated that blaming others significantly accounted for 8% of the variance in the informal enjoyment participation variable (R^2 = .079; **Table 6**).

Formal with whom. To examine the predictive value of coping in determining the diversity of individuals with whom youth participate in formal activities (formal with whom), age was entered into step 1, while 2 significant coping strategies were included in step 2 – cognitive restructuring and social withdrawal. The results indicated cognitive restructuring contributed to 9% of the variance in the formal with whom variable (R^2 = .086; **Table 7**).

Table 6. Results of hierarchical regression analysis predicting "informal enjoyment" (n = 281)

Variable	B	SE B	β
Step 1			
Sex[a]	.215	.063	.199**
Age at interview	-.017	.009	-.107
Step 2			
Sex[a]	.194	.064	.179**
Age at interview	-.014	.009	-.088
Social support	.127	.074	.100
Blaming others	-.152	.069	-.129*

Note: R^2 =.054 for step 1; ΔR^2= .025* for step 2.
[a]Male=0; Female=1.
*P < .05. **P < .01.

Table 7. Results of hierarchical regression analysis predicting "formal with whom" (n = 249)

Variable	B	SE B	β
Step 1			
Sex[a]	.215	.063	.199**
Age at interview	-.017	.009	-.107
Step 2			
Sex[a]	.194	.064	.179**
Age at interview	-.014	.009	-.088
Social support	.127	.074	.100
Blaming others	-.152	.069	-.129*

Note: R^2=.054 for step 1; ΔR^2= .025* for step 2.
[a]Male=0; Female=1.
*$P < .05$. **$P < .01$.

Table 8. Results of regression analysis predicting "formal where" (n = 249)

Variable	B	SE B	β
Step 1			
Cognitive restructuring	.507	.226	.141*

Note: R^2=.020.
*$P < .05$.

Formal where. The sixth and final equation examined the predictive value of coping in determining where youth participate in formal activities (at home, at a relative's home, in the neighborhood, at school, outside of the classroom, in the community, outside of the community). Cognitive restructuring was entered into step 1 of the regression analysis. Results demonstrated that cognitive restructuring accounted for 2% of the variance in this variable (R^2 = .020; **Table 8**). Of note, this formal participation variable was not related to any of the demographic or injury-related variables.

Discussion

The primary goal of this investigation was to determine whether individual coping strategies predicted participation in both informal and formal activities, above and beyond significant demographic and injury-related variables. In general, results from this investigation provided support for both hypotheses and suggest that higher levels of positive coping strategies and lower levels of negative and avoidant coping strategies are associated with more favorable participation outcomes. This is consistent with research associating adaptive coping with positive outcomes among youth with asthma[11] and youth with cancer,[12] but runs contrary to Zehnder et al.'s[8] finding that active coping predicted emotional distress among youth with a physical injury or a chronic medical issue.

When considering the results of univariate analyses, coping was associated with all informal participation variables that were assessed. In contrast, coping was only related to the formal participation variables that measured which individuals youth participated in activities with (with whom) and the settings in which they engaged in these activities (where). This may reflect the fact that youth are able to participate in informal activities more independently, more spontaneously, and with less assistance from others including parents. On the other hand, participation in formal activities requires greater coordination and assistance from parents. Therefore, as a youth characteristic, coping strategies may be more strongly related to informal participation. Alternatively, it is plausible that participation in formal activities poses a significant challenge for youth with SCI, one that cannot be overcome solely by the use of adaptive coping strategies. Future research should strive to better understand factors that contribute to participation in informal and formal activities.

Although hypotheses were supported, only certain individual coping strategies demonstrated significant relationships with participation outcomes. Regarding positive coping strategies, first, higher levels of social support (seeking support from others) were related to increased participation in informal activities. This result illustrates a common theme within the field of general pediatrics,[28] and in the literature relevant to adults with SCI,[29] that emphasizes the association between positive social relationships/support

and positive adjustment outcomes. For example, research has found that opportunities for social engagement among youth with chronic medical issues promotes positive adjustment outcomes, including development of communication and social skills.[21] As compared to formal activities, informal activities are likely to be more spontaneous in nature and also more youth-driven. As a result, seeking out opportunities for social support may naturally lead to more frequent participation in informal activities.

Second, higher levels of the positive coping strategy cognitive restructuring, which involves identifying faulty and maladaptive cognitions and replacing them with more accurate and adaptive beliefs (focusing on the "good side" of things), were associated with participation in formal activities with a greater diversity of individuals and in settings further away from the home. Among the various types of adaptive coping strategies that have been discussed in the pediatric literature, cognitive restructuring has been reported as being particularly effective. For example, in a population of youth with cancer, more frequent use of cognitive restructuring was associated with lower reported levels of emotional distress.[12] Here, cognitive restructuring was particularly important to the settings in which youth participated in formal activities and the individuals with whom they participated in formal activities. As stated above, engagement in formal activities typically requires youth to obtain greater support and involvement from their parents. Youth who have developed the ability to use cognitive restructuring are likely to have more positive emotional functioning[12] as well as greater self-esteem. In turn, these youth may be better able to accept the fact that they need assistance to engage in formal activities and to advocate on their own behalf in order to obtain support from their parents to engage in opportunities, particularly those formal activities that take place in settings beyond the home and with a greater diversity of individuals.

Regarding maladaptive (negative and avoidant) coping strategies, lower levels of particular coping strategies, including social withdrawal (keeping to oneself), blaming others (blaming other individuals as the cause of one's problems), and self-criticism (blaming oneself as a the cause of a problem), were found to be related to favorable participation outcomes in the informal domain, such as participating with a more diverse group, experiencing greater enjoyment, and experiencing increased participation frequency, respectively. These findings are consistent with previous research that has suggested that these types of negative and avoidant coping strategies are related to difficulties in general social-emotional functioning. For example, use of negative coping strategies, including social withdrawal and blaming others, has been associated with emotional disorders in children.[30] In particular, increased social withdrawal has been linked to negative outcomes in youth, including deficits in social skills and depression.[31] It is likely that youth with SCI who use social withdrawal as a coping strategy are less likely to seek out interactions with others. Similarly, youth who spend less time blaming others for their stressors may be better able to enjoy their daily activities. Finally, it is possible that those youth who criticize themselves less frequently may have more positive self-esteem, which may facilitate a higher frequency of participation in activities. Of note, each of these 3 coping strategies can be categorized as "person-related," given that they all involve maladaptive strategies related to self or others. These are in contrast with the other negative/avoidant coping strategies studied, including distraction (trying to "forget" about a problem and/or doing something to keep from thinking about a problem), wishful thinking (wishing that the problem had not occurred and/or wishing for one's situation to change), and resignation (deciding not to do anything about a problem because it cannot be changed) that are less directly related to individuals but rather involve primarily emotional and/or cognitive components. It would appear that among the maladaptive strategies, the person-related coping strategies are most relevant to participation outcomes.

When interpreting the findings of the study, it is important to consider several limitations. The first set of limitations is associated with the design of the investigation. For example, the cross-sectional nature of the study does not allow for determination of causality among variables.

Therefore, future research should be aimed at conducting longitudinal studies with this pediatric population. In addition, it is important to note that the participants in this study were recruited from 3 hospitals within a single hospital system. Therefore, the sample may not adequately reflect the general population of children and adolescents with SCI.

The second set of limitations is relevant to the variables of coping and participation. Most important, although several coping strategies were found to significantly contribute to participation outcomes, these contributions were relatively small (R^2 ranged from .020 to .232). Furthermore, the lack of significant relationships between coping and participation was particularly relevant for formal participation variables, which was anticipated given that this population of youth is less likely to participate in formal activities. This suggests that other factors contribute to participation outcomes for youth with SCI and indicates the need for future research to identify and better understand these factors. Second, the construct of coping has long been cited as problematic due to varying conceptualizations and definitions, different measurement tools, and the impact of context when using various coping strategies. These issues can become problematic when interpreting these data.[32] Therefore, future research might consider gathering qualitative data along with quantitative data to gain a better understanding of this construct. [32] This would be useful in gaining an understanding of coping directly from the perspective of children and adolescents using their own words, particularly among youth with SCI given the limited amount of coping research that has been conducted with this population. Related to this, much of the coping literature groups strategies together into categories such as "positive" and "negative." Future research should attempt to distill which strategies relate to specific outcomes; a better understanding of the effect of particular strategies would be significantly beneficial for informing clinical practice. Finally, related to the participation, it is important to be mindful of the potentially large impact that a child's family plays on his/her ability to engage in informal and formal activities. Given that this population of youth may have to rely on their parents to coordinate activities to a greater extent than their peers without SCI (or with disabilities in general), it will be important for future research to gather information on relevant parent variables and examine the impact of these factors on child participation outcomes.

Conclusion

This research provides information on the relationship between coping strategies and participation outcomes among a sample of youth with SCI. The findings suggest that interventions aimed at promoting the use of active coping strategies, namely seeking social support and using cognitive restructuring techniques, may facilitate positive participation outcomes. In addition, interventions might also integrate strategies for identifying use of negative and avoidant coping and assist youth with ways in which they might decrease their use of self-criticism, social withdrawal, and blaming others. Finally, results demonstrated relationships between coping and frequency of participation in activities, enjoyment of participation in activities, where youth participate in activities, and with whom they participate in activities. Clinical interventions to promote positive coping and participation may assist not only with increasing overall involvement and enjoyment in activities, but also with increasing participation in activities that promote social engagement in multiple settings and with a diversity of individuals.

Acknowledgments

Jennifer Lindwall, PhD, completed a clinical predoctoral internship at the Temple Health Sciences Center in Philadelphia, Pennsylvania, from 2009-2010. During this internship year, she participated in clinical work and assisted with a longitudinal study at the Shriners Hospitals for Children in Philadelphia and received mentorship from Heather Russell, PhD, and Erin Kelly, PhD, to complete this article. After receiving her PhD, Jennifer began a postdoctoral fellowship at St. Jude Children's Research Hospital to continue

clinical work and research in the field of pediatric psychology.

This research was funded by the Shriners Hospitals for Children grant 9143.

We thank the patients and caregivers for the time and effort they contributed to this research investigation.

REFERENCES

1. National Institute of Neurological Disorders and Stroke. NINDS spinal cord injury information page. http://www.ninds.nih.gov/disorders/sci/sci.htm. Accessed August 31, 2009.
2. Gorman C, Kennedy P, Hamilton L. Alterations in self-perceptions following childhood onset of spinal cord injury. *Spinal Cord.* 1998;36:181-185.
3. National Spinal Cord Injury Association. Fact Sheet. 2010. http://www.spinalcord.org/news.php?dep=17&page=94&list=1196. Accessed June 6, 2010.
4. Allden P. Psychological aspects of spinal cord injury. *Educ Child Psychol.* 1992;9(1):34-48.
5. Victorson D, Farmer L, Burnett K, Ouellette A, Barocas J. Maladaptive coping strategies and injury-related distress following traumatic physical injury. *Rehabil Psychol.* 2005;50(4):408-415.
6. Hernandez B, Vigna J, Kelly M. The youth coping responses inventory: development and initial validation. *J Clin Psychol.* 2010;66(9):1008-1025.
7. Kupst M, Bingen K. Stress and coping in the pediatric cancer experience. In: Brown RT, ed. *Comprehensive Handbook of Childhood Cancer and Sickle Cell Disease: A Biopsychosocial Approach.* New York: Oxford University Press; 2006:35-52.
8. Zehnder D, Prchal A, Vollrath M, Landolt M. Prospective study of the effectiveness of coping in pediatric patients. *Child Psychiatry Human Develop.* 2006;36(3):351-368.
9. Marsac M, Funk J, Nelson L. Coping styles, psychological functioning and quality of life in children with asthma. *Child: Care Health Dev.* 2007;33(4):360-367.
10. Frank N, Blount R, Brown R. Attributions, coping, and adjustment in children with cancer. *J Pediatr Psychol.* 1997;22(4):563-576.
11. Van De Ven M, Engels R, Sawyer S, Otten R, Van Den Eijnden R. The role of coping strategies in quality of life of adolescents with asthma. *Qual Life Res.* 2007;16(4):625-634.
12. Trask P, Paterson A, Trask C, Bares C, Birt J, Maan C. Parent and adolescent adjustment to pediatric cancer: associations with coping, social support, and family function. *J Pediatr Oncol Nurs.* 2003;20(1):36-47.
13. King G, Petrenchik T, Law M, Hurley P. The enjoyment of formal and informal recreation and leisure activities: a comparison of school-aged children with and without physical disabilities. *Int J Disabil Dev Educ.* 2009;56(2):109-130.
14. Klaas S, Kelly E, Gorzowski J, Homko E, Vogel L. Assessing patterns of participation and enjoyment in pediatric spinal cord injury. *Dev Med Child Neurol.* 2010;52:468-474.
15. Morris C. Measuring participation in childhood disability: How does the capability approach improve our understanding? *Dev Med Child Neurol.* 2009;51:92-94.
16. King G, Law M, Hurley P, Hanna S, Kertoy M, Rosenbaum P. Measuring children's participation in recreation and leisure activities: construct validation of the CAPE and PAC. *Child: Care Health Dev.* 2006;33(1):28-39.
17. McVeigh S, Hitzig S, Craven B. Influence of sport participation on community integration and quality of life: a comparison between sport participants and non-sport participants with spinal cord injury. *J Spinal Cord Med.* 2009;32(2):115-124.
18. Mulcahey M. Returning to school after a spinal cord injury: perspectives from four adolescents. *Am J Occup Ther.* 1992;46(4):305-312.
19. Law M, King G, King S, Kertoy, M., Hurley P, Rosenbaum P, Young N, Hanna S. Patterns of participation in recreational and leisure activities among children with complex physical disabilities. *Dev Med Child Neurol.* 2006;48:337-342.
20. Reiter-Purtill J, Waller J, Noll RB. Empirical and theoretical perspectives on the peer relationships of children with chronic conditions. In: Roberts MC, Steele RC, eds. *Handbook of Pediatric Psychology.* New York: Guilford Press; 2009:672-688
21. Kang L, Palisano L, Orlin M, Chiarello L, King G, Polansky M. Determinants of social participation: with friends and others who are not family members—for youths with cerebral palsy. *Phys Ther.* 2010;90(12):1743-1757.
22. Anderson C. Pediatric-onset spinal cord injury: psychosocial issues. *SCI Nurs.* 2003;20(3):212-214.
23. Spirito A, Stark L, Williams C. Development of a brief coping checklist for use with pediatric populations. *J Pediatr Psychol.* 1988;13(4):555-574.
24. Lazarus R, Folkman S. *Stress, Appraisal, and Coping.* New York, NY: Springer Publishing; 1984.
25. Spirito A, Stark L, Tyc V. Stressors and coping strategies described during hospitalization by chronically ill children. *J Clin Child Psychol.* 1994;23:314-322.
26. King G, Law M, King S, et al. *Children's Assessment of Participation and Enjoyment (CAPE) and Preferences for Activities of Children (PAC).* San Antonio, TX: Harcourt Assessment, Inc; 2004.
27. Dasch K, Russell H, Kelly E, et al. Coping in caregivers of youth with spinal cord injury. *J Clin Psychol Med Settings.* 2011;18(4):361-371.
28. Barakat L, Pulgaron E, Daniel L. Positive psychology in pediatric psychology. In: Roberts MC, Steele RG,

eds. *Handbook of Pediatric Psychology*. 4th ed. New York: Guilford Press; 2009:763-770.
29. Duggan C, Dijkers M. Quality of life after spinal cord injury: a qualitative study. *Rehabil Psychol*. 2001;46(1):3-27.
30. Garralda M, Rangel L. Impairment and coping in children and adolescents with chronic fatigue syndrome: a comparative study with other paedeatric disorders. *J Child Psychol Psychiatry*. 2004;45(3):543-552.
31. Katz S, Conway C, Hammen C, Brennan P, Najman J. Childhood social withdrawal, interpersonal impairment, and young adult depression: a meditational model. *J Abnorm Child Psychol*. 2011;39(8):1227-1238.
32. Spirito A. Commentary: pitfalls in the use of brief screening measures of coping. *J Pediatr Psychol*. 1996;21(4):573-575.