

An Outdoor Adventure Program for Young Adults with Cancer:  
Positive Effects on Body Image and Psychosocial Functioning

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**Abstract**

This study evaluated the psychological effects of an outdoor adventure program on young adult cancer survivors (ages 18-39). The six-day adventure program included personal instruction and supervision on the basics of kayaking, surfing, or climbing. Compared to a wait-list control group, participants who took part in the program for the first time had improved (relative to pre-test) body image, self-compassion, self-esteem, and less depression and alienation. Participants who took part for the second time, although also helped by the program in similar ways, were no better off psychologically than participants who took part for the first time. Possible explanations for both the positive effects and their apparent short duration are offered.

Keywords: Young adult; cancer survivors; adventure therapy; body image; self-compassion; depression

When diagnosed with cancer, young adults face unique challenges in their lives. Most young adults have concerns about their bodies and about being comfortable with who they are and who they want to become. Typical challenges at this phase of life include initiating intimate and emotional relationships, separating from parents, and making independent decisions about future goals, such as those centering on career, education, and family (Arnett, 2000). Young adults possess limited, or at best maturing, psychological coping mechanisms. Few of their peers have experienced severe or traumatic life experiences from which they might observe and learn. Spending intense hours and days with others who have experienced a similar life experience—cancer—offers trip-goers an opportunity to learn how others have coped with missed time at school or work, lost boyfriends/girlfriends, managing emotions of family members or friends, managing uncomfortable side effects of treatment, (re)-engaging in social activities. The typical challenges of young adulthood become more difficult when a person is also coping with the physical, psychological, and social difficulties that accompany a cancer diagnosis and treatment (D’Agostino, Penny, & Zebrack, 2011).

Peer support programs offer opportunities for young adult cancer patients and survivors to build important interpersonal and problem-solving skills to help them cope with cancer, its treatment, and its effect on their lives. Young adults learn problem-solving strategies from other young adults who have already experienced some of the same challenges. Additionally, the renewed confidence that one experiences from an outdoor adventure program trip can get translated to other life challenges and problems.

Moreover, such programs create a sense of community among support group members, which in turn reduces feelings of social isolation that frequently plague young adults with cancers (Crom, 2009; Zebrack, Bleyer, Albritton, Medearis, & Tang, 2006; Zebrack, Oeffinger, Hou, & Kaplan, 2006). Participating in peer-group activities improves psychological well-being (Roberts et al., 1997) and coping capabilities (Adler & Page, 2008) for young adults, and has been demonstrated to be particularly important for cancer patients who have had poor support networks (perhaps a sign of alienation and/or isolation), low self-esteem, and low self-efficacy, compared to cancer patients who had higher self-esteem and self-efficacy (Helgeson, Reynolds, & Tomich, 2006). As a specific type of peer group intervention, outdoor recreation and adventure programs for adolescent and young adult patients and survivors have been shown to boost self image, self-confidence, independence, social involvement and coping skills (Elad, Yagil, Cohen, & Meller, 2003; Stevens, Kagan, Yamada, Epstein, Beamer, et al., 2004). These programs aim to encourage emotional growth and physical confidence by giving young adult survivors the opportunity to challenge themselves, set and achieve goals, and share new experience with peers. Prior research has demonstrated positive and restorative effects of support interventions conducted in natural environments (Cimprich, & Ronis, 2003).

The present study extends this previous research by examining the effects of a specific outdoor adventure program on the psychosocial functioning of young adult cancer survivors. Based on previous research as well as anecdotal reports of past program participants, we were specifically interested in the possible effects the program might have on: body image, self-compassion, self-esteem, depression, alienation, and feelings

of isolation. The experience of cancer often has a negative impact on these psychosocial variables, leaving an enduring mark on many young adult cancer survivors (Zebrack & Butler, 2012).

## **Methods**

### *Aims*

We investigated the effects of an outdoor adventure program on a range of psychological characteristics of young adult cancer survivors. Two groups of participants took part in the adventure program: those for whom it was their first outdoor adventure program (P1) and those for whom it was their second such program (P2). We predicted that participants in the P1 group would improve psychologically compared to a wait-list control group (WL). To assess such possible effects, we compared the difference in how both groups fared from pretest to post-test. We also predicted that pretest participants in P2 would be psychologically better off than participants in P1. To assess such a possible effect, we compared both groups at pretest. Moreover, we expected participants in the P2 group to be sensitized to the effects of the program, and thus to benefit more from it. Therefore, we also compared the difference in how both groups fared from pretest to post-test.

### *Participants*

Young adult cancer survivors (ages 18-39) enrolled in a six-day outdoor adventure program (which began between May 2011 and October 2012), or were placed on a waiting list during the period of data collection (May 2011 – November 2012).

Participants in the outdoor adventure programs engaged in kayaking, surfing, or

climbing. During the course of their programs, participants were introduced to the basics of whitewater kayaking, surfing or rock climbing. No prior experience was necessary, and participants were given personal, professional instruction and supervision. Program staff and guides provided one-on-one instruction whenever needed to accommodate survivors with physical limitations such as amputations, weakness and balance problems, vision and hearing impairment, or seizures. Each day participants embarked on a physical adventure, allowing them to challenge themselves individually and collectively within a safe, supportive environment among peers. Free time was scheduled to allow relationships between participants to develop naturally, and to ensure ample opportunity to rest for those still coping with physical side effects of their treatment.

One hundred and sixty two eligible participants enrolled in their first adventure program were invited to take part in the study (P1), 92 enrolled in their second adventure program were invited to take part (P2), and 234 wait-listed for their first adventure program (WL) were invited to take part in the study. Initially participants were not offered any material incentive for participating in this study, but after a disappointing response rate during the first month of data collection, we began offering a special sweatshirt upon completion of all questionnaires at post-test; this incentive increased our response rate.

### *Procedure*

After IRB approval from Heartland IRB, a commercial IRB organization, participants completed a battery of psychological questionnaires on two occasions: 2-3 weeks before they began the program, the *pretest*, and 2-3 weeks after they completed the program, the

*post-test*. Participants in the WL control group completed the tests with the same lag between the two sessions, but did not take part in a program.

Participants were sent emails at both time intervals, with links that directed them to two websites that presented the questionnaires; two websites were used because one of the measures was only available through one company, and the other questionnaires could not be accessed through that company. We sent a reminder to participants who had agreed to take part but did not complete the questionnaires within five days. If participants did not complete the questionnaires after the reminder, we considered them to have dropped out and did not contact them again.

### *Study Measures*

Standardized measures were used to assess body image, self-compassion, and psychosocial function.

We administered the Body Image Scale (BIS; Hopwood, Fletcher, Lee, & Al Ghazal, 2001), a 10-item scale developed to assess body image in cancer survivors; respondents rate on a 4-point scale their agreement/disagreement with each statement. Research indicates that this scale is reliable ( $\alpha = 0.93$ ) and valid ( $p < 0.001$ , Mann-Whitney test), and is sensitive to change over time ( $p < 0.001$ , Wilcoxon signed ranks test).

Participants also completed the Self-Compassion Scale-Short Form (Raes, Pommier, Neff, & Van Gucht, 2011), a 12-item scale that assesses self-compassion, defined by three main components: “self-kindness, a sense of common humanity, and mindfulness when considering personal weakness or hardship” (Neff, & Vonk, 2009).

This scale is derived from the 26-item Self-Compassion Scale (Neff, 2003). Research suggests that self-compassion is associated with a more stable form of self-worth (compared to self-esteem, which is often contingent on the outcome of one's efforts). The short form was highly correlated with the long form ( $r \geq 0.97$ ), which has high internal reliability ( $\alpha = .90$ ; Neff, 2003) and test-retest consistency (.93; Neff, 2003), as well as convergent validity (Neff, 2003).

The third measure administered was the Psychological Screening Inventory-2 (PSI-2), a brief 130-item mental-health screening tool (Lanyon & Thomas, 2013) that contains five scales of major categories of psychological functioning, 21 content scales of specific psychosocial content areas, and six scales of the likelihood that test-takers are misrepresenting themselves. The various types of reliability and validity for the scales are discussed in the test's technical manual (Lanyon, 2010). We hypothesized that participants would be beneficially affected by the outdoor adventure program on the following variables: *Low self-esteem*, alienation (on the PSI-2, referred to as *Isolated/Alone/Alienated*), socially outgoing (the flip side of isolation; on the PSI-2, referred to as *Verbally, Socially Outgoing*), and depression. The PSI-2 provides two scales related to depression: A 9-item general screening scale, *Depression*, assessing self-reported symptoms of depression, including related thoughts, feelings, and behavior; and a 7-item content scale, *Depressive Feelings*, which includes some items from the general *Depression* scale (they have four questions in common), and also items associated with low self-esteem: "I have little confidence in myself" and "Sometimes I am no good for anything."

We also examined psychological variables on the PSI-2 of secondary interest that we expected might be positively affected by the adventure program: *Discomfort; Anger/Aggression; Fatigue/Low Energy; Anxious Feelings; Memory/Concentration Problems; and Somatic Anxiety Symptoms.*

Medical-related information was assessed at both pre- and post-test via self-report and included whether: participants had surgery, were receiving treatment (of any type, such as chemotherapy and/or radiation) at the time they took part in the study, and participants' treatment or side effects adversely affected their quality of life.

## **Results**

We began by examining the demographics of our participants, and then turned to the results of the study proper.

### *Demographics*

In examining people who were invited to participate and did complete the study versus those who did not complete the study, we identified three types of eligible participants who did not become actual participants: those who did not respond to requests for participation (*No response*); those who completed only some of the measures at pretest or post-test, and thus produced incomplete data (*Incomplete*); those who completed all of the measures at pretest but none at post-test (*Dropout*). We compared these people to those who completed all measures at both time intervals (*Complete*). The final sample size used for data analysis (the *Complete* group) was 71 for WL, 87 for P1, and 41 for P2. Table 1 shows the distribution of eligible participants in each group. The three groups (WL, P1, P2) differ in their relative composition of non-responders,

incomplete responders, dropouts, and complete responders,  $\chi^2(6)=34.8$ ,  $p<.0001$ . A chi-squared test that excludes non-responder data confirms that the three groups do not differ in their relative composition of incomplete responders, dropouts, and complete responders,  $\chi^2(4)=6.25$ ,  $p=.18$ . Table 2 provides demographic data about the final sample, broken down by group.

[Insert Table 1 about here]

[Insert Table 2 about here]

*Age.* Participants in the WL control group were, on average, 1.8 years younger than those in P1 and 2.0 years younger than those in P2 (see Table 1); a one-way omnibus test revealed a trend for group difference in age,  $F(2,198)=2.32$ ,  $p=.10$ , and a contrast revealed that the experimental groups were older than the WL control group,  $F(1,198)=3.93$ ,  $p=.034$ . Because age did not correlate significantly with any of the outcome variables at pretest, we do not consider this statistical difference to be meaningful, nor see how it could affect the interpretation of the results of the study.

*Gender.* Although fewer males than females participated in all groups, the WL control group appeared to have had a higher proportion of males (19.7%) than did P1 (12.6%) and P2 (12.7%); however, there was no significant difference in gender composition between the WL control and P1 group (Fisher's exact  $p=.28$ ) or between P1 and P2 groups ( $p=.20$ ).

*Treatment at pretest.* Compared to the other groups, relatively fewer participants from the P1 group reported receiving any treatment at the time of pretest (17.2% versus

36.6% for WL and 29.3% for P2). Comparing the P1 with P2 group, this difference was not significant (exact  $p = .09$ ); however, comparing the P1 with WL groups, this difference was significant (exact  $p = .007$ ). To evaluate this variable as a potential confound in the P1 versus WL comparisons, we analyzed whether it correlated significantly with any of the outcome variables at pretest, the changes in outcome variables over time, or the differential changes over time for one group versus the other. In all cases, there were no significant effects of pretest treatment. Thus, because pretest treatment status bears no relationship to the outcome variables—or how they change over time—we do not consider it a confound between the groups.

*Timeline of receiving treatment.* A higher percentage of the WL group was receiving treatment at the time of the pretest, at the time of the post-test, and had surgery within 6 months of taking the pretest (see Table 2). Moreover, a higher percentage of the WL group reported that the treatment or its effects significantly affected their quality of life.

It is possible that these treatment-related differences partly explain why participants in the WL group fared worse on some variables at post-test relative to pretest. If the participants in the WL group had a comparable amount of treatment as those in the P1 group, and felt that it affected their quality of life comparably, WL respondents might have fared better at post-test—which in turn would minimize the “effect” of the P1 program because the difference in scores between WL and P1 would have been smaller.

We conducted additional statistical tests to examine this possibility, which revealed that the amount of treatment participants received does not mitigate or alter any of the effects we report below ( $p > .1$  in all cases). Thus, these results stand, as we describe

them. To examine this issue further, we also examined whether—in spite of the differences in the amount of medical treatment received—the WL and P1 groups differed at pretest on body image, self-compassion, self-esteem, depression, isolation, or alienation. The answer in all cases is no—the two groups were not statistically different on these psychological variables (see Table 3, particularly the fifth column;  $p$  values for  $t$ -test comparisons ranged from .13 for anger/aggression to .99 for low self-esteem).). Thus, the treatment-related differences are not likely to have affected the results.

[Insert Table 3 about here]

#### *Questionnaire scores*

We analyzed the results from the questionnaires by comparing the post-test scores to the pre-test scores for each participant.

*Program 1 compared to the wait-list control.* We examined the change scores (post-test minus pretest) for each psychological variable of interest. As noted in Table 4, fifth column, all but three of those variables were statistically significant (at least  $p < .05$ ). After the adventure program, P1 had (relative to WL) improved body image, self-compassion, self-esteem, and less discomfort, depression (as assessed by both depression scales), alienation, fatigue/low energy, memory/concentration problems, and somatic anxiety symptoms. Unaffected were their anger/aggression, anxious feelings, and verbally, socially outgoing scores.

[insert Table 4 about here]

We also failed to find any significant differences between the two groups in whether they were in a relationship, whether their treatment involved surgery, whether they were receiving treatment at post-test, or whether they felt that treatment affected or was affecting their quality of life,  $p > .1$  in all cases.

Additional analyses revealed that the effects of the P1 program on body image depended on whether respondents reported that their lives were adversely affected by their medical treatment,  $F(1,154) = 6.07, p = .01$ . For respondents whose lives were not significantly impacted by their treatment (left panel, Figure 1), body image improved – but improved no more than it did for the WL group. That is, body image improved simply with the passage of time for members of both the WL and P1 groups who reported that their lives were *not* affected by their treatment. In contrast, the body image of members of the P1 group who reported that their quality of life had been adversely impacted by their treatment *did* improve after the program (right panel, Figure 1). Note that at pretest, members of both the WL and P1 groups whose quality of life was affected by their treatment (right panel) had lower body image scores (worse body image) than their counterparts who reported that their quality of life was not affected by treatment (left panel).

[Insert Figure 1 about here]

*Program 2 compared to Program 1.* We next compared P1 and P2 at pretest; in theory, P2 should have been better off psychologically at pretest than P1, given that the

participants in P2 had already experienced one outdoor adventure program. However, we failed to find any significant differences in the psychological variables between the two groups at pretest (see the right-most column of Table 3;  $p$  values for t-test comparisons ranged from .11 for anger/aggression to .98 for low self-esteem).

In addition, we considered whether the P2 experience led to a greater change from pretest to posttest, compared to this change for the P1 group. An argument could be made that even though participants in the P1 and P2 groups were comparable at pretest, members of the P2 group should have a greater response to the program because they had been sensitized by their earlier experience. However, this was not the case: We did not find any significant differences between P1 and P2 on the degree of change from pretest to post-test in the psychological variables of interest (see right-most column of Table 4).

### **Discussion**

Compared to the WL control participants, people who took part in the program for the first time (P1) had significantly better body image, self-compassion, self-esteem, and less depression and alienation after completing the program. In addition, their psychological distress, fatigue and low energy, memory and concentration, and anxiety about bodily symptoms improved significantly compared to the WL group. However, the improvement in the last three variables may be a result of decreased symptoms of depression, such as decreased energy, memory and concentration problems, and bodily symptoms of anxiety. But even if the improvement in these three types of symptoms is indirectly caused by the program's reducing symptoms of depression, these benefits still are effects of the program.

In addition, we found that the body image of members of the P1 group whose lives were not impacted by their treatment improved no more than it did for the WL group. In contrast, members of P1 group who reported that their quality of life had been adversely impacted by their treatment had improved body image compared to members of the WL group. One way to think about these results is that participants whose quality of life suffered as a result of treatment felt less positively about their bodies—perhaps because of physical side effects of treatment—and that the P1 program helped this group—and only this subset—to boost their body image. Whether or not treatment affected respondents' quality of life was the only demographic or medical demographic factor that influenced whether or not the P1 program made a difference at post-test, and only for body image—not for any other psychological variable of interest in this study.

It is also worth noting that although the P1 participants became less depressed, had less general psychological distress, and increased self-esteem and self-compassion, the control participants reported the opposite experience. Thus, the effects of the P1 program actually overcame a trend to develop a poorer psychological state over time.

The P1 program did not affect feeling anxious, isolated, or aggressive/angry. The failure to find an effect on anxiety probably reflects the specific anxiety symptoms assessed by the four questions on the PSI-2 scale, which focus on social anxiety (“people often embarrass me”) and general fears (“things are always frightening me”). Cancer survivors must endure many frightening situations, thoughts, and procedures. The type of anxiety assessed in the PSI-2 may not adequately capture the types of anxiety most likely to occur for cancer survivors, nor the type of anxiety most likely to be ameliorated by an outdoor adventure program. Moreover, the lack of effect of the P1 program on feeling

isolated can be explained by the characteristics of young adult cancer survivors who are likely to enroll in an outdoor adventure program: People who feel isolated are not likely to be interested in taking part in a physically strenuous program that involves constantly being around others. In fact, all participants—WL control group and outdoor adventure program participants—were already low in feelings of isolation at pretest.

Not all variables improved after the program, which allows us to rule out a counter-interpretation of the other results: If all variables we assessed had been affected by the program, one might suggest that participants' responses were the result of an experimenter demand effect—that participants responded as they believed we expected them to respond, namely that all variables improve after the program. The fact that not all predictions were confirmed allows us to be less concerned about this possibility.

We also examined whether the beneficial effects of P1 endure over time by comparing P2 at pretest (when P2 participants had experienced only one program) with P1 at pretest (before P1 participants had experienced any program). Surprisingly, P2 participants were not significantly better off at the outset of this program than were the P1 participants, who had not yet experienced an outdoor adventure program.

To understand more about the relationship between the pretest scores of P2 and P1, we also compared P2 pretest scores with P1 scores *after* the program. We found no carry-over effects. However, these particular people may have signed up to participate in a second program because they realized that the beneficial effects of their P1 program had dissipated. That is, P1 graduates who elected to attend a second program (P2) are a subset of P1 graduates; this subset may have characteristics that lead the beneficial effects of the P1 experience to fade more quickly than they did for the P1 graduates who

did not elect to attend a second program. Such characteristics might include health-related factors, personality-related factors, or specific aspects of their experiences during the P1 program. Unfortunately, the current study design does not allow us to examine this hypothesis further. It would be useful to assess P1 participants over time to discover whether all of them regressed back to their baseline states – and, if not, to learn what variables predict which participants will retain the benefits of the program over time.

We also compared how the two groups, P1 and P2, fared from pretest to post-test, and found no differences on any of the variables of interest. That is, P2 participants did not have a significant additional benefit (nor did they fare worse) compared to P1 participants.

#### *Implications for Clinical Practice*

Recent literature suggests that young adults perceive that camps and retreat programs specifically designed for them as beneficial (Eiser & Kuperberg, 2007; Zebrack, Mills, & Weitzman, 2007); however, a substantial proportion of young adults indicate that their need for young-adult-specific programs are unmet (Zebrack, Corbett, Embry, Aguilar, Meeske et al., in press). Facilitating young adult referrals to programs like the one described in this article have the potential to satisfy patient needs across a continuum of care.

#### **Conclusion**

A six-day outdoor adventure program for cancer survivors improved the participants' body image, self-compassion, self-esteem, depression and alienation from pretest to post-test, compared to a wait-list control. Participants on their second adventure program were

not, at pretest, significantly better off than participants who had not yet been on their first program. One possible explanation for this finding is that the effects of the adventure program may not endure, at least for participants who want to enroll in a second program—which may be why those participants want to enroll in a second program.

*References:*

- Adler, N. E., & Page, A. (2008). *Cancer care for the whole patient: Meeting psychosocial health needs*. Washington, D. C.: National Academies Press.
- Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist*, *55*, 469-480.
- Cimprich, B. & Ronis, D.L. (2003). An environmental intervention to restore attention in women with newly diagnosed breast cancer. *Cancer Nursing*, *26*, 284-292.
- Crom, D. B. (2009). "I think you are pretty: I don't know why everyone can't see that": Reflections from a young adult brain tumor survivor camp. *Journal of Clinical Oncology*, *27*, 3259-3261.
- D'Agostino, N. M., Penney, A., & Zebrack, B. (2011). Providing developmentally appropriate psychosocial care to adolescent and young adult cancer survivors. *Cancer*, *117*(10 Suppl), 2329-2334.
- Eiser, C. & Kuperberg, A. (2007). Psychological support for adolescents and young adults. In W. A. Bleyer & R. D. Barr (eds.), *Cancer in adolescents and young adults*, New York: Springer, pp. 365-373.
- Elad, P., Yagil, Y., Cohen, L. H., & Meller, I. (2003). A jeep trip with young adult cancer survivors: lessons to be learned. *Supportive Care in Cancer* *11*, 201-206.
- Helgeson, V. S., Reynolds, K. A., & Tomich, P. L. (2006). A meta-analytic review of benefit-finding and growth. *Journal of Consulting and Clinical Psychology*, *74*, 797-816.

- Hopwood, P., Fletcher, I., Lee, A., & Al Ghazal, S. (2001). A body image scale for use with cancer patients. *European Journal of Cancer, 37*, 189–197.
- Lanyon, R. I., (2010). *PSI-2: Technical Manual*. London, ON: Research Psychologist Press, Inc.
- Lanyon, R. I., Thomas, M. L. (2013). Assessment of global psychiatric categories: The PSI/PSI-2 and the MMPI-2-RF. *Psychological Assessment, 25*, 227-232.
- Neff, K. D., & Vonk, R. (2009). Self-compassion versus global self-esteem: Two different ways of relating to oneself. *Journal of Personality 77*, 23-50.
- Neff, K.D. (2003). The development and validation of a scale to measure self-compassion. *Self and Identity, 2*(3), 223-250.
- Raes, F., Pommier, E., Neff, K. D., & Van Gucht, D. (2011). Construction and factorial validation of a short form of the Self-Compassion Scale. *Clinical Psychology & Psychotherapy. 18*, 250-255.
- Roberts. C., Piper, L., Denny, J., & Cuddeback, G. (1997). A support group intervention to facilitate young adults' adjustment to cancer. *Health & Social Work, 22*, 133-141.
- Stevens, B., Kagan, S., Yamada, J., Epstein, I., Beamer, M., et al. (2004). Adventure therapy for adolescents with cancer. *Pediatric Blood Cancer, 278-284*.
- Zebrack, B., Bleyer, A., Albritton, K., Medearis, S., & Tang, J. (2006). Assessing the health care needs of adolescent and young adult (AYA) cancer patients and survivors. *Cancer, 107*, 2915-2923.
- Zebrack, B., & Butler, M. (2012). Context for understanding psychosocial outcomes and behavior among adolescents and young adults with cancer. *Journal of the National Comprehensive Cancer Network 10*, 1151-1156.

Zebrack, B., Corbett, V., Embry, L., Aguilar, C., Meeske, K. A., Hayes-Lattin, B., Block, R., Zeman, D. T., Cole, S. (in press). Psychological distress and unsatisfied need for psychosocial support in adolescent and young adult (AYA) cancer patients during the first year following diagnosis, *Psycho-Oncology*.

Zebrack, B.J., Mills, J., & Weitzman, T.S. (2007). Health and supportive care needs of young adult cancer patients and survivors, *Journal of Cancer Survivorship, 1*(2), 137-145.

Zebrack, B., Oeffinger, K., Hou, P., & Kaplan, S. (2006). Advocacy skills training for young adult cancer survivors: The Young Adult Survivors Conference (YASC) at Camp Mak-a-Dream. *Supportive Care in Cancer, 14*, 779-782.