

Community Peer Support Among Individuals Living with Spinal Cord Injury  
by  
Joy McLeod

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Carleton University  
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Joy McLeod

## **Abstract**

Previous research has demonstrated that the relation between peer support and well-being is unclear among individuals living with SCI. The present study expands on these findings by exploring the conditions under which peer support is more strongly associated with better adjustment. Participants were 135 individuals living with SCI recruited through social media and major SCI organizations globally who completed an online self-report questionnaire. Although peer support, as measured by the SCI-PSI, was not associated with better adjustment, a measure of perceived support (i.e., the level of satisfaction with the peer support one receives) was associated with all indicators of adjustment. Individuals who were more satisfied with the peer support they received exhibited fewer depressive symptoms, had higher subjective well-being, experienced less loneliness, and exhibited better community reintegration. Longitudinal research is needed to better understand the adjustment trajectory of persons with SCI who are recipients of peer support.

*Keywords:* spinal cord injury, peer support, perceived support, adjustment, well-being

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## Community Peer Support Among Individuals Living with Spinal Cord Injury

Spinal cord injuries not only result in permanent disruptions to normal sensory, motor, and autonomic functioning, they also have a significant effect on one's psychological well-being and social relationships. Experiencing a traumatic life event, like acquiring an SCI, makes one feel different from others, oftentimes poorly understood – or worse, rejected (Dickson et al., 2011; Tait & Silver, 1989; Veith et al., 2006). Talking with similar others (i.e., peers, other individuals living with SCI) offers both practical and emotional benefits (Haas et al., 2013; Veith et al., 2006). Peers can address SCI-related concerns and offer emotional support, particularly empathy and acceptance, in a way that is unmatched by other supportive relationships (Veith et al., 2006). Although qualitative enquires have pointed to a number of benefits to the peer relationship, quantitative research on the benefits of peer support for individuals living with SCI is modest and somewhat inconsistent (Sweet et al., 2016; Sweet et al., 2018). The proposed investigation hopes to offer descriptive data on the types of peer support community-living individuals with SCI utilize and to elucidate the inconsistent quantitative results by clarifying under what social conditions peer support is more strongly associated with indicators of healthy adjustment. It is hypothesized that the effect of peer support on adjustment will depend upon the quality of one's social support from family and friends, such that the effect will be stronger for individuals with little to no social support from other informal sources (e.g., family and friends) or those who experience social constraints in their relationships with family and friends.

Life following SCI is challenging. In the event of a traumatic SCI, one must recover from the initial trauma of the injury and adapt to ongoing physical and functional limitations that can effectuate significant changes in one's lifestyle. For example, acquiring an SCI may threaten one's ability to pursue meaningful pre-injury goals (Davis & Porter, 2018). Because of all these

challenges, it is perhaps not surprising that individuals with SCI are at higher risk of depression, anxiety, and post-traumatic stress disorder relative to those without SCI (Migliorini et al., 2008; Post & van Leeuwen, 2012). Despite this, many people who sustain an SCI are resilient, exhibiting stable low symptoms of anxiety and depression (Bonanno et al., 2012). In order to facilitate adjustment following injury, it is essential to gain a better understanding of the psychological and social factors associated with resilience among this population.

One factor widely viewed as important in the adjustment process following SCI is the quality of social support available (Beedie & Kennedy, 2002; Müller et al., 2012). In a systemic review of the literature, Müller et al. (2012) concluded that social support is consistently associated with better mental health. For example, Beedie and Kennedy (2002) found in a sample of people who had experienced a traumatic SCI that quality, but not quantity, of social support was associated with lower levels of depression and hopelessness at six- and eighteen-weeks post-injury. Social support has also been linked to subjective well-being, satisfaction with life, and quality of life among individuals living with SCI (LaVela et al., 2018; Müller et al., 2012). Support from others is associated with better physical health outcomes as well, such as lower morbidity and mortality; social support is correlated with fewer health problems, disability-related problems, and secondary health conditions (e.g., bladder infections and pressure ulcers). Although most studies relating social support to adjustment in the context of SCI are cross-sectional – which limits our ability to make causal inferences – at least one study has shown that social support among individuals living with SCI predicted a lower mortality rate at an 8-year follow-up (Krause & Carter, 2009).

Social support comes in a variety of forms. For example, people may help others with the practical demands of daily life (practical support), or they may provide others with useful

information (informational support). People may also listen empathetically and provide indications of love, reassurance, and compassion (emotional support). This latter type of support – allowing one the opportunity to talk about one’s SCI-related difficulties and distress in a non-judgmental manner – can facilitate adjustment, but often attempts to offer support may fail (Tait & Silver, 1989; Wortman & Lehman, 1985).

When attempts at providing social support fail, oftentimes by well-intentioned family and friends, it can be a source of distress, particularly when talking with others leaves one feeling misunderstood, unsupported, or rejected (termed “social constraints” or “unsupportive responses”; Burg & Seeman, 1994; Ingram et al., 2001; Lehman et al., 1986; Lepore & Helgeson, 1998; Lepore & Revenson, 2007; Tait & Silver, 1989). Wortman and Lehman (1985) propose three ways in which loved ones intend to be supportive but fall short: they discourage disclosure, encourage the individual to move on, or use scripted responses that are invalidating (e.g., “I know how you feel”). In a sample of men who had been treated for prostate cancer, Lepore and Helgeson (1998) assessed the extent to which social constraints, intrusive thoughts, and avoidance were related to mental health. They found that social constraints, especially from one’s spouse, predicted poorer mental health in part because the individual tried to avoid thinking and talking about cancer-related issues. In a qualitative study conducted by Veith et al. (2006), individuals living with SCI reported that their loved ones’ inability to grasp that they would not walk again was distressing and that it was a barrier to discussing practical issues (e.g., their mobility needs). Cordova et al. (2005) also found that social constraints were strongly associated with greater PTSD symptomology and higher levels of depression in a sample of people who had experienced a traumatic injury.

In an attempt to better understand the conditions under which social support is helpful, Wortman and Lehman (1985) asked bereaved individuals to describe what had been particularly helpful since the loss of their loved one. The three most cited responses were contact with similar others, being given the opportunity to openly discuss feelings, and having others express genuine concern for them. As such it may be that talking with similar others (i.e., one's peers) about one's SCI-related thoughts and issues has benefits for one's adjustment following injury, particularly when support from other sources (e.g., family and friends) is constrained or unhelpful.

Peer support is defined as “the giving of assistance and encouragement by an individual considered as equal” (Haas et al., 2013, p. 295). Peer support comes in many forms (Mead et al., 2001). Individuals can connect with similar others through formal mentorship programs (where the peer has received training) on a one-on-one basis in-hospital or in the community or through informal connections with others who have not received peer-support training. Organizations, like SCI Ontario, may also offer drop-in programming (e.g., support groups), social clubs, and advocacy and outreach groups to facilitate relationship building and information sharing with one's broader community of peers (who have not received training in supportive techniques). With modern advancements in voice-activated technology, peer support can also be accessed informally through online platforms, such as reddit (e.g., [r/spinalcordinjuries](#) community). Because what passes for peer support can vary in format, services, training, and structure, it is perhaps not surprising that the empirical literature on the benefits of peer support is inconsistent.

Using qualitative methods Veith and colleagues (2006) sought to identify which aspects of the peer relationship differentiate it from other supportive relationships in one's life. They identified several unique components, specifically credibility, equitability, mutuality, acceptance,

and normalization. Because of their peer mentor's lived experience, mentees considered their mentor the most credible source of information – in fact, they were considered by some to be more credible than health professionals. Part of what made their peer credible was that their peer was able to speak to all aspects of living with SCI, whereas health professionals were limited to their scope of practice. Equitability – seeing oneself as an equal – was another core feature of the relationship that made it unique. Similarly, the mutuality in the SCI experience created a sense of understanding that was incomparable to other relationships as most mentees found talking to their friends about their SCI difficult. The feeling of being understood and accepted was vital to mentees. For example, one mentee shared, “[Nurses] would want to give me antidepressants. They want to drug you. ‘Cause they don’t want you to cry and have emotions... Well, [my mentor], I could cry to her... with her; she was safe. I knew that she wouldn’t go tell anybody that I was crying and that I needed to have more antidepressants” (p.295). Finally, mentors normalized the individual's experience by sharing intimate details about their feelings (and how they changed over time) and daily routines.

Despite the encouraging qualitative findings on peer support and adjustment following SCI, few studies have explored the role of peer support quantitatively. In a pair of studies drawing from the same sample, Sweet et al. (2018) and Rocchi et al. (2018) compared quality of life of community-residing individuals with SCI who had received peer support to a similar group that had not received peer support. The studies indicated that the two groups did not differ in quality of life or use of various coping strategies. A potential weakness of these studies was the way in which peer support was measured; participants were categorized as mentees (i.e., having had at least four mentorship sessions over the past five years) or non-mentees (i.e., having had one or no mentorship sessions over the past five years). Because of how peer mentorship

was operationalized, it is not possible to distinguish between mentees who engaged in short-term (or infrequent) contact with their mentor and those who engaged in long-term (or frequent) contact with their mentor. Setting aside the issue of how peer support was measured, the lack of association between peer support and quality of life may be owing to the possibility that the groups differed in the extent to which they received quality social support from family and friends (Müller et al., 2012). Peer support may be particularly effective when other sources of support are perceived to be inadequate.

Peer support has also been evaluated in other health-related fields and a similar pattern emerges – one of positive qualitative reports and inconsistent quantitative results (Dale et al., 2012; Kessler et al., 2014; Levy et al., 2019; Thoits et al., 2000). Kessler et al. (2014) conducted qualitative interviews with sixteen stroke survivors following a brief peer support intervention, a ten-minute hospital visit to offer a message of hope to the stroke survivor followed by five telephone visits at one, three, six, nine, and twelve months post-discharge. They found the peer intervention had numerous benefits (e.g., emotional, affirmational, and informational) and no harms; stroke survivors found the emotional support that was provided during this period of adjustment especially valuable. Peer mentors encouraged, motivated, validated, and inspired their fellow stroke survivors and made them feel less alone, and much like individuals living with SCI, stroke survivors found the information they received from their mentors more valuable than that of healthcare professionals as peer mentors “provided a real face” (p.4). Another qualitative enquiry by Borregaard and Ludvigsen (2017) found similar benefits among nine lung cancer patients. Importantly they found that support from one’s peer – talking with someone who truly understood how they felt – enabled emotional disclosure and that having someone to relate to in this way made them feel less alone.

Thoits et al. (2000) explored the effect of a peer support intervention among men who had undergone coronary artery bypass surgery while in the hospital and found no group differences between the experimental group and the control group (i.e., men who received approximately four hours of visitation in-person with a peer who was briefly trained in supportive techniques versus treatment as usual). However, they discovered that talking with fellow patients (i.e., similar others who were not trained peers) predicted a number of positive outcomes such as better self-rated health at one-month, higher satisfaction with one's health at one- and six-months, lower levels of distress at one-month (and marginally lower levels of distress at six- and twelve-months), and lower levels of depression at all three waves/timepoints.

In a systemic review of the literature on peer support interventions among individuals with acquired brain injury, cerebral palsy, or spina bifida, Levy et al. (2019) found inconsistent results; of the six randomized controlled trials reviewed, only two found peer support led to improvements in quality of life. For example, Stamatakis (2015) tested the efficacy of a five-week community-based group peer support intervention among stroke survivors and their primary caregivers (versus a waitlist control). Participants in the peer support condition reported decreased psychological distress and increased perceptions of social support and quality of life post-intervention and at a four-week follow up, whereas the control group did not. Dale et al. (2012) completed a similar review of the literature on peer support among people living with diabetes and found peer support led to clinical and behavioural improvements (e.g., improvements in glycemic control, blood pressure, cholesterol, BMI and weight, physical activity, reintegration, depression, and perceptions of social support) in some, but not all, of the clinical trials that were evaluated.

There are also mixed findings regarding peer support programs among individuals living with cancer (for a review, see Campbell et al., 2004). Some studies report positive outcomes among peer support recipients while others report no differences between peer support recipients and non-recipients of peer support, and yet others report potential adverse effects of peer support (Campbell et al., 2004; Hoey et al., 2008; Mens et al., 2016; Steginga et al., 2004). For example, in a set of three studies that evaluated different types of support interventions among women with breast cancer (i.e., education, peer support, education plus peer support, and a control condition), Helgeson and colleagues (1999; 2000; 2001) found the educational intervention was associated with better outcomes at two-week, six-month, and three-year follow ups. In fact, the peer support intervention, which focused solely on emotional disclosure, was associated with some short-term negative effects, specifically more downward social comparisons, negative affect, and negative interactions within the group. Of relevance to the proposed research, the authors found an interaction; peer support was beneficial for women who lacked support from other sources (i.e., their significant others or physicians) but detrimental (at least in the short-term) for women who had quality support from others; the detrimental effects were no longer present at the three-year follow up.

Ussher and colleagues (2006) conducted a large-scale qualitative study which examined peer support groups among people living with cancer. They found participants responded equally well to professional-led and peer-led group settings – the leader’s credentials were not important. Rather participants valued a supportive environment, mutuality in the relationships they built, the sense of belonging that was fostered, and whether the group met their needs. Interestingly, one of the benefits of group peer support that was cited by several participants was the ability to joke about their experience with cancer in a non-judgmental atmosphere as humour tended to be met

with negativity from others without cancer (e.g., family and friends). For example, one participant stated, “people who have cancer belong to a special club and it’s just a different outlook on life, it’s a different experience and you laugh about things which some people are a bit aghast about” (p.2569).

Although research on the benefits of peer support among clinical populations has yielded inconsistent results, most recipients of peer support report being satisfied with the experience and appreciate the informational and emotional support, particularly the mutuality in the relationship (Kessler et al., 2014; Steginga et al., 2004; Veith et al., 2006). For instance, Steginga et al. (2004) found in a sample of men with prostate cancer that 83% were satisfied or very satisfied, 14% were somewhat satisfied, and only 3% were dissatisfied with the support they received from their peer support group. Veith et al. (2006) found roughly 86% of participants were satisfied with their peer mentor; one peer recipient living with SCI reported, “It’s more comfortable for me to talk to somebody who’s [sic] been through it. Who’s [sic] actually been through it and just not read about it. What it’s actually like, not just what they read in the book” (p.294). Across studies very few recipients had complaints about their experience and complaints tended to be about technical aspects of the intervention, such as the timing of the intervention, the peer match, or the ambiguity about the possibility of future contact (Haas et al., 2013; Kessler et al., 2014; Veith et al., 2006).

### **The Present Study**

Peer support within the community is more flexible and variable than most of the peer support interventions previously reviewed and is intended to build lasting relationships and promote community integration. For example, SCI Ontario’s peer support program allows the peer recipient to set the frequency of visits, the topics, and the mode of communication (F.

Boccheciampe, personal communication, August 25, 2020). A peer mentee may have more than one mentor, depending on the subjects they would like to discuss and the availability of mentors who are comfortable mentoring on those topics. The proposed research aims to add to literature in the field by offering descriptive data on the peer support community-living individuals with SCI engage with.

Another aim of the proposed research is to assess the psychometric properties SCI Peer Support Inventory (SCI-PSI) which was created for this study to assess the value of peer support among individuals living with SCI (i.e., internal consistency and validity). The scale was created to have three subscales that capture the three ways peers help individuals living with SCI cope with SCI-related challenges as per Veith et al. (2006) – practical, emotional, and identity-changing influence (which involves helping the recently injured individual rebuild or redefine their identity as functional limitations may have blocked previously meaningful pursuits).

## **Hypotheses**

### ***Hypothesis 1***

In order to provide preliminary evidence of the construct validity of the SCI-PSI, I hypothesized that each of the three subscales – practical, emotional, and identity-changing influence – would be negatively correlated with depressive symptoms and loneliness and positively correlated with subjective well-being and reintegration.

### ***Hypothesis 2***

Although qualitative studies suggest that peer support has many benefits for the recipient of the support, peer support is likely to be most valuable for the recipient when support from family and friends is lacking or constrained.

I hypothesized that the correlation of peer support with adjustment (i.e., symptoms of depression, reintegration, well-being) would be stronger for individuals with little to no social support from other informal sources (family and friends) or those who experience social constraints in their relationships with family and friends relative to those with high levels of support from family and friends, and those without social constraints.

### ***Hypothesis 3***

I also expected that individuals with low quality social support from family and friends (i.e., those with little to no social support or those who experience social constraints) would engage with their peers more frequently and be more satisfied with the peer support they receive than individuals with high quality social support from family and friends.

### ***Hypothesis 4***

I also predicted that certain aspects of the support one receives from one's peers would be associated with better adjustment. I expected that individuals who engage with their peers more frequently, who receive emotional support from their peers, and who are satisfied with their peer relationship(s) would experience fewer depressive symptoms, higher levels of subjective well-being, less loneliness, and a greater sense of reintegration.

## **Method**

### **Participants**

Participants were 135 community-living individuals who have acquired an SCI. Recruitment took place online using three popular social networking sites: Facebook, Instagram, and reddit. Participants were also recruited through SCI Ontario's Community Magazine (available in print and online), and through other SCI organizations located outside of Canada (e.g., various local chapters of the United Spinal Association). The sample consisted of 72 males

and 63 females with a mean age of 42.36 years ( $SD = 14.83$ ). Most participants were located in the United States (69.6%), 23.7% were located in Canada, 4.4% were located in Europe and the United Kingdom, and 2.1% were located elsewhere (e.g., Australia). Many participants (45.2%) reported living with their spouse or partner, 25.2% reported living with their parents, 21.5% reported living alone, 16.3% reported living with their children, and 5.2% endorsed other living situations (e.g., living with a sibling or roommates, or supported living).<sup>1</sup> The sample was relatively well-educated with 25.2% having obtained a college degree, 22.2% having obtained a bachelor's degree, and 17.0% having obtained a masters' or professional doctorate (PhD). The remaining 35.6% of participants received some high school education (no diploma; 0.7%), graduated high school (7.4%), or received some college or university education (no degree; 27.4%).

The sample included individuals who had sustained their SCI within the last 5 years (43.7%), those who had sustained their SCI more than 5 years ago (51.9%), and those who chose not to disclose when their SCI had occurred (4.4%).<sup>2</sup> Spinal cord injury etiologies varied, with 42.2% due to a motor vehicle accident, 17.8% due to sports and recreation (e.g., ATV accident, diving), 14.8% due to a fall, 11.9% due to medical reasons (e.g., surgery, tumour), 5.2% due to violence, and 8.1% due to some other cause (e.g., a work-related injury). The sample included diagnoses of tetraplegia (40.7%), paraplegia (44.4%), and ambulatory (14.8%).

To estimate statistical power for the interaction of social support and peer support on

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<sup>1</sup> Please note that participants were allowed to select multiple responses, so the total percentage exceeds 100%.

<sup>2</sup> Originally, I intended to recruit only community-living individuals who had acquired an SCI within the last 5 years, but due to slow recruitment, this eligibility criteria was later removed.

depressive symptoms, I assumed (based on prior literature) that the correlation of peer support with depressive symptoms will be  $r \sim -.25$  (Parra et al., 2018; Stice et al., 2004), of social support with depressive symptoms will be  $r \sim -.35$  (Müller et al., 2012), and of social support with peer support will be  $r \sim .20$  (Stice et al., 2004). I further assumed that the standardized effect of the interaction of peer support with social support on depressive symptoms will be  $beta = .20$ . With these values, we used *Mplus* to estimate  $n$  for power of .80. These analyses indicated that a sample of 150 would yield a significant interaction effect 80% of the time.

## **Procedure**

Informed consent was obtained before beginning the survey. To accommodate participants with varied physical and technological abilities, the survey was able to be completed with or without assistance. It was available online on Qualtrics to be completed independently ( $n = 134$ ) or with the help of the lead researcher over the telephone ( $n = 1$ ). The survey was approximately 15-30 minutes in length and incorporated both closed- and open-ended questions. It assessed select demographic information, social support from family and friends, social constraints, peer support from others living with SCI, depressive symptoms, subjective well-being, loneliness, and reintegration. Participants were debriefed once the survey was completed and offered mental health resources. Three participants were randomly drawn to win a \$50 gift card for participating. Ethics approval was obtained from Carleton University's research ethics committee (Ethics Clearance ID: # 114704).

## **Materials**

### ***Demographics***

Participants were asked their gender, geographic location, age, level of education, and current living situation. They were asked about their SCI, specifically injury etiology, time since injury (TSI), and injury severity (i.e., injury level and classification; see Appendix A).

### ***Social support***

Social support from family and friends was assessed with an adapted version of the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988). The MSPSS assesses an individual's perceptions of social support from a significant other (i.e., "special person"), family, and friends. The scale was modified from the original 12 items to 9 items, and to distinguish family/friend/special friend support from peer support, I added "who does not have an SCI" to the special person items and "non-SCI" to the family and friend items. Sample items include, "You get the emotional help and support you need from your family and/or non-SCI friends" and "There is a special person who does not have an SCI in my life who cares about my feelings," with each statement rated on a 7-point Likert scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Confirmatory factor analysis indicated that although all special person items loaded on one factor and all friends and family support items loaded on a second factor, the two factors were very highly correlated ( $r = .87$ ), suggesting only one factor. Therefore, it was combined into a single mean score.

The MSPSS has been utilized in a variety of contexts – in cross-cultural and general population studies, among adolescents, older adults, clinical populations, and trauma survivors – and has demonstrated good internal consistency, test-retest reliability, and construct validity (Cecil et al., 1995; Eker & Arkar, 1995; Laksmi et al., 2020; Stanley et al., 1998; Zimet et al., 1988). The MSPSS demonstrated excellent reliability in the present study,  $\alpha = .92$ .

### ***Social Constraints***

The extent to which participants felt uncomfortable, misunderstood or alienated talking to support providers about their feelings and concerns was assessed with the 15-item Social Constraints Scale (SCS; Lepore & Ituarte, 1999). Sample items include, “how often in the last month have your family and friends minimized your problems?” and “how often in the last month have your family and friends avoided you?” Each statement is rated on a 5-point Likert scale, ranging from 0 (*never*) to 4 (*often*). The SCS was originally developed to measure social constraints among people living with cancer, so the word “illness” was replaced with “condition” for the purposes of this study. I also added two items to address other issues that have been noted in the literature: “how often in the last month have your family and friends told you they know how you feel” (Wortman & Lehman, 1985) and “how often in the last month have your family and friends did things for you that you wanted to do and could have done yourself” (Ingram et al., 2001).

Although the SCS has not been used before to assess constraints among people living with SCI, the scale has been validated in samples of individuals living with cancer and other health conditions (for a review, see Lepore & Revenson, 2007). The SCS has demonstrated excellent internal consistency (Cordova et al., 2005; Cordova et al., 2007; Herzer et al., 2006; Koutrouli et al., 2016; Nenova et al., 2013) and test-retest reliability (Cordova et al., 2007; Herzer et al., 2006; Lepore & Ituarte, 1999) with a variety of clinical populations (i.e., people who have experienced a traumatic injury, women with breast cancer, cancer survivors, and hematopoietic stem cell transplant survivors). The SCS demonstrated excellent internal consistency in the present study as well,  $\alpha = .90$ .

### ***Peer Support***

Prior to completing the Spinal Cord Injury Peer Support Inventory participants were asked questions about the nature of the peer support they receive. They were asked how many peers they are in contact with, how often they are in contact with them, whether they interact with them on an individual basis or in a group format (or both), how they interact with them (e.g., online), and whether they meet with peers who have received training. Participants were also asked how satisfied they are with the peer support they receive; satisfaction was rated on a 5-point Likert scale ranging from 1 (*very dissatisfied*) to 5 (*very satisfied*). They were also asked if any of these factors had changed (and how) due to the COVID-19 pandemic. Finally, they were asked what aspects of the peer relationship they value the most and whether there are any aspects of the peer relationship that are not valuable or that impact them negatively.

Peer support for persons with SCI was measured with the Spinal Cord Injury Peer Support Inventory (SCI-PSI), which was created for this study using the positive support subscale of the Prostate Cancer Peer Support Inventory as a guide (Steginga et al., 2004). Ten of the original fourteen items were adapted to be relevant to individuals living with SCI. For example, “felt reassured about my manhood” was changed to “I feel reassured about my personhood by my SCI peers.” As is evident from this example, the inventory was changed to be in the present tense (as I was assessing ongoing community peer support as opposed to a short-term peer support intervention) and I added the clause “by (or from) my SCI peers” to each item to iterate my interest in the impact from SCI peers as opposed to the participant’s family and friends or medical professionals.

Prior to deployment in this study, the draft version of the SCI-PSI was evaluated by an experienced peer mentor with SCI Ontario and her recommendations were adopted. The final

SCI-PSI has 15 items, each rated on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*; see Table 1). The survey was pilot tested with four persons living with SCI.

The SCI-PSI was designed to have three subscales (not in the original Prostate Cancer Peer Support Inventory) which were driven by qualitative enquires (Gifre et al., 2014; Haas et al., 2013; Veith et al., 2006). The three subscales measure distinct categories of support, specifically practical, emotional, and identity-changing influence (Veith et al., 2006). Three items which highlighted practical or informational support that were specific to prostate cancer were removed and items reflecting identity-changing influence were included. For example, “received practical advice about coping with impotence” was removed. The following three items were added: “my SCI peers have helped me regain a sense of purpose in my life,” “my SCI peers have helped me realize that my life – even though it may be different – can be meaningful,” and “my SCI peers are an inspiration to me”. Confirmatory factor analysis indicated that although each item loaded strongly on its factor, the three factors were very highly correlated ( $r = .91-.93$ ), suggesting only one factor. Therefore, it was combined into a single mean score. The SCI-PSI demonstrated excellent reliability in the present study,  $\alpha = .95$ .

### ***Depressive symptoms***

The Center for Epidemiologic Studies Depression Scale Revised (CESD-R10; Radloff, 1977) was used to assess depressive symptoms. Participants were asked how often, in the past week, they have felt or behaved in certain ways, such as “I was bothered by things that usually don’t bother me” and “I felt depressed.” Responses were rated on a 4-point Likert scale ranging from 0 (*rarely or none of the time: less than 1 day*) to 3 (*all of the time: 5-7 days*). The CESD-10 is a widely used and well-validated self-report measure of depression (Björgvinsson et al., 2013). The scale has also demonstrated good convergent and divergent validity, and excellent internal

consistency ( $\alpha = .86$ ) and test-retest reliability among people living with SCI (Miller et al., 2008). The CESD-10 demonstrated very good reliability in the present study,  $\alpha = .88$ .

### ***Subjective well-being***

Diener (1984) proposed that subjective well-being is comprised of three major components: the presence of positive affect, the relative absence of negative affect, and the sense that one's life is satisfying (a cognitive assessment). Given the tripartite structure of subjective well-being (SWB), a composite score was created using the Positive Affect (PA) subscale, the Negative Affect (NA) subscale (both derived from PANAS), and the Satisfaction with Life Scale (SWLS; Diener et al., 1985).

Positive mood was assessed using the Positive Affect subscale of PANAS (Watson et al., 1988). Participants were asked how often in the past few weeks they had felt various positive emotions. Some sample items targeting positive affect include “enthusiastic” and “inspired.” The scale has 11 items which are measured on a 5-point Likert scale ranging from 1 (*not at all*) to 5 (*very often*). The subscale was revised to include the low arousal, positive valence mood state “calm,” and the adjective “strong” was replaced with “confident” to avoid the misinterpretation of physical strength. The PA subscale has demonstrated good internal consistency among individuals living with SCI in past research ( $\alpha = .89$ ; Peter et al., 2016). In the present study, the PANAS-PA demonstrated excellent reliability as well,  $\alpha = .92$ .

Negative mood was assessed with a slightly modified version of the Negative Affect subscale of PANAS (Watson et al., 1988). Participants were asked to quantify how often in the past few weeks they had felt various negative emotions. The modification of the instrument involved adding two emotions that would be relevant to people with SCI: “frustrated” and “annoyed”. Each of the 12 negative affective states was rated on a 5-point Likert scale ranging

from 1 (*not at all*) to 5 (*very often*). The negative affect (NA) subscale has demonstrated good internal consistency among persons with SCI in past research ( $\alpha = .77$ ; Peter et al., 2016). The PANAS-NA demonstrated excellent internal consistency in the present study as well,  $\alpha = .92$ .

Finally, the SWLS is a 5-item scale which was used to assess how satisfied participants are with their life. Participants were asked to what extent they agree or disagree with each statement (e.g., “If I could live my life over, I would change almost nothing.”) on a 7-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The SWLS has demonstrated good validity (concurrent and divergent) and internal consistency among individuals living with SCI in past research,  $\alpha = .83$  (Post et al., 2012). The SWLS demonstrated very good reliability in the present study as well,  $\alpha = .86$ .

Each component was then transformed to a Proportion of Maximum Possible (POMP) before being averaged with the other components; this is due to the various components being measured on different scales (Cohen et al., 1999). To calculate POMP, a participant’s score on each measure was converted to a proportion of the highest possible score, with 0 representing the lowest possible score and 1.0 representing the highest possible score. A SWB score for each participant was then obtained by averaging his or her POMP score for satisfaction with life, positive affect, and negative affect (which was reverse scored). This method has demonstrated acceptable internal consistency when used among individuals living with SCI (Davis & Novoa, 2013).

### ***Loneliness***

The 3-item Loneliness Scale (Hughes et al., 2004) was used to assess feelings of loneliness. Participants were asked “how often do you feel you lack companionship,” “how often do you feel left out,” and “how often do you feel isolated from others?” Responses were rated on

a 5-point Likert scale, ranging from 1 (*never*) to 5 (*always*). The scale was modified from a 3-point Likert scale to a 5-point Likert scale for the purposes of this study to afford sufficient discrimination. The 3-item Loneliness scale has demonstrated acceptable internal consistency in previous research with older adults,  $\alpha = .72$  (Hughes et al., 2004) and among people living with SCI (Robinson-Whelen, 2016) as well as evidence of convergent and divergent validity (Hughes et al., 2004; Robinson-Whelen, 2016). The 3-item Loneliness scale demonstrated very good reliability in the present study,  $\alpha = .86$ .

### ***Reintegration***

The Reintegration to Normal Living Index (RNLI; Wood-Dauphinee et al., 1988) was used to measure community participation/reintegration in two domains, physical and social. Confirmatory factor analysis revealed that although each item loaded strongly on its factor, the two factors were highly correlated ( $r = .80$ ), suggesting only one factor. Participants were asked to what extent they feel the provided statements describe their situation. The scale has 11 items rated on a 3-point Likert scale ranging from 0 (*does not describe my situation*) to 2 (*fully describes my situation*). Sample items include: “I am able to participate in recreational activities as I want to” and “I feel that I can deal with life events as they happen.” There is strong evidence that the RNLI is a valid measure of community reintegration with this population in terms of construct, content, convergent, and discriminant validity as well (Hitzig et al., 2012; McCombs et al., 2020; Mothabeng et al., 2012). The scale has also demonstrated excellent internal consistency ( $\alpha = .87-.97$ ) among community-living individuals with SCI in past research (Hitzig et al., 2012; McCombs et al., 2020; Mothabeng et al., 2012). In the present study, the RNLI demonstrated very good reliability as well,  $\alpha = .86$ .

## **Analysis Strategy**

A series of correlations were conducted to determine the relation between the different aspects of peer support (e.g., types of support, satisfaction with the support received, etc.) and indicators of healthy adjustment (i.e., depressive symptoms, subjective well-being, loneliness, and reintegration) as well as perceived social constraints and social support from family and friends. Next, I conducted a hierarchical multiple linear regression to assess the extent to which the different support variables (i.e., social support family and friends, social constraints, and peer support) uniquely predicted adjustment. Finally, I tested an interaction model to assess whether the effect of peer support on adjustment following SCI depended upon the level of social support from family and friends.

## **Results**

### **Data Cleaning**

Although recruiting participants through social media has numerous benefits (e.g., the ability to connect with hard-to-reach populations), it is not without its disadvantages, such as participant misrepresentation which can lead to data quality issues (Kramer et al., 2014; Pozzar et al., 2020). Kramer et al. (2014) recommends holding a draw for a subset of participants, as was done in the present study, as opposed to offering compensation to all participants; they posit that the delay between participation and compensation, and the uncertainty of compensation can reduce participant misrepresentation. Pozzar et al. (2020) recommend stringent data cleaning strategies to preserve data quality, which were applied in the present study. Initially, the sample for this study consisted of 232 participants. Twenty-eight participants were removed for failing to complete at least 75% of the survey, 24 participants were removed for completing the survey in less than 10 minutes, 13 participants were removed for not meeting the eligibility criteria (i.e.,

they indicated they had no SCI peers), and 32 participants were removed for response sets, nonsense responses, or duplicate responses to one or more open-ended items (Pozzar et al., 2020). This resulted in a final sample size of 135 participants.

Two of the critical constructs assessed in this study – peer support and support from friends and family – yielded responses that were highly negatively skewed (skewness > -.92). Since most scores were at or very near the ceiling of the scales, no transformation would render a normal distribution of scores. Dichotomizing the scores into high (at or above median) and low (below median) is one way of eliminating skewness but results in significant loss of information. Despite the highly skewed distributions, I report analyses involving the variables in their original metric but have also reported in footnotes the results using the dichotomized variables when these findings differ.

### **Preliminary Analysis**

T-tests and ANOVAS were conducted to determine whether demographic variables were significantly associated with any variables of interest, specifically social support from family and friends, social constraints, peer support, depressive symptoms, subjective well-being, loneliness, and reintegration. Gender was only associated significantly with one variable of interest, reintegration; males ( $M = 2.33$ ,  $SD = .37$ ) compared to females ( $M = 2.09$ ,  $SD = .50$ ) reported significantly better reintegration,  $t(129) = -3.08$ ,  $p = .003$ . Age and education were not associated with any variables of interest. Injury level was condensed into three groups, cervical, thoracic, and lumbar/sacral. It was significantly associated with subjective well-being,  $F(2,129) = 3.38$ ,  $p = .037$ , such that those with cervical injuries scored marginally higher on subjective well-being ( $M = 59.46$ ;  $SD = 16.99$ ) than those with lumbar/sacral injuries ( $M = 50.12$ ;  $SD = 18.59$ ),  $p = .052$ , and neither grouped differed from those with thoracic injuries. Injury level was also

marginally associated with peer support  $F(2,131) = 3.02, p = .052$ ; those with cervical injuries scored significantly higher on peer support ( $M = 3.86; SD = .92$ ) than those with thoracic injuries ( $M = 3.41; SD = 1.06$ ),  $p = .042$ , and neither group differed from those with lumbar/sacral injuries. Injury classification (i.e., tetraplegia, paraplegia, and ambulatory) was only associated with social support from family and friends,  $F(2,131) = 3.94, p = .022$ , such that individuals whose injury was classified as tetraplegia felt significantly more supported by their non-SCI family and friends ( $M = 4.35; SD = .71$ ) than those whose injury was classified as ambulatory ( $M = 3.81; SD = .79$ ), and neither group differed from those whose injury was classified as paraplegia. Individuals who had sustained their injury within the last 5 years were also compared with those who had sustained their injury more than 5 years ago; they differed only on one variable of interest, depressive symptoms; individuals who had sustained their injury within the last 5 years ( $M = 12.26, SD = .69$ ) had significantly more depressive symptoms than those who had sustained their injury more than 5 years ago ( $M = 9.70, SD = .67$ ),  $t(126) = -2.13, p = .035$ .

Table 2 summarizes correlations conducted to assess the associations between the support variables and adjustment variables of interest. Perceived social support from family and friends was significantly associated with all adjustment variables of interest, specifically symptoms of depression, subjective well-being, loneliness, and reintegration ( $.29 < |r| < .50, ps < .001$ ). Level of social constraints was also significantly associated with all adjustment variables of interest ( $.36 < |r| < .48, ps < .001$ ). Peer support was significantly associated with social support from family and friends ( $r = .21, p = .013$ ), however it was not significantly associated with any other variables of interest, particularly level of social constraints, symptoms of depression, subjective well-being, loneliness, or reintegration ( $-.04 < r < .09, ps > .314$ ).

## ***Peer Support***

On average the sample was satisfied with the support they receive from their peers ( $M = 3.95$ ;  $SD = .95$ ) and rated having other people in their condition available to connect with as important to very important ( $M = 4.24$ ,  $SD = .82$ ). To illustrate, one participant stated,

The connection I have with my peers is difficult to put into words. There is a sense of unity we share in the fact that we know exactly what each of us is going through or experiencing, mostly as it relates to SCI-related issues (i.e., struggles with bladder and bowel management, inaccessibility, housing, employment, dating... etc). What I find most satisfying about the peer support I receive is that I never have to explain myself. My peers get it, they get me.

Forty-one percent of participants reported that the COVID-19 pandemic has changed how much they value the peer support they receive, with one participant expressing, “It's shown me how important it is and how disruptive it is to lose that support” and yet another saying, “I value it more, I didn't realize how big a difference it made.”

Participants reported being in contact with their peer(s) 2-4 times a month, on average ( $M = 5.58$ ;  $SD = 1.57$ ; scale ranged from 1 = never to 7 = more than once a week). Approximately 15% of participants reported interacting with their peers more frequently since the onset of the COVID-19 pandemic, 55.6% reported interacting less frequently with their peers now, and 29.6% reported no change due to the COVID-19 pandemic. When participants meet with their peers, 34.8% meet one-on-one, 20.5% meet in a group format, and 44.7% meet both one-on-one and in groups.<sup>3</sup>

## **Main Analysis**

### ***Hypothesis 1***

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<sup>3</sup> Before the COVID-19 pandemic, participants met with their peers in-person (71.1%), virtually, online (33.3%), and conversed over the telephone (38.5%). Approximately 60% of participants responded that this had changed due to the COVID-19 pandemic, with no in-person meetings and all interactions shifting online. One participant stated, “all interactions are virtual, less frequent, and less fulfilling.”

I hypothesized that each of the three subscales of the SCI-PSI – practical, emotional, and identity-changing influence – would be negatively correlated with depressive symptoms and loneliness and positively correlated with subjective well-being and reintegration. Although confirmatory factor analysis indicated that the data fit the intended structure well (TLI = .946, RMSEA = .063), the factors were very highly correlated ( $r_s > .90$ ) suggesting that the data better fit a single factor model. Consequently, I report analyses based on the mean score for the scale as a whole. Peer support was not significantly associated with symptoms of depression or loneliness. It was also not significantly correlated with subjective well-being or reintegration (see Table 2).

### ***Hypothesis 2***

To test the hypothesis that the association of peer support with adjustment (i.e., symptoms of depression, reintegration, well-being) would be stronger for individuals with little to no social support from other informal sources (family and friends) than for those with greater social support, I conducted a moderated regression analyses such that each of these dependent variables was regressed on level of peer support, level of support from friends and family, and their multiplicative interaction (after mean-centering). These analyses also controlled for time since injury. The first model of support from family and friends, peer support, and time since injury to predict symptoms of depression (Model 1) was statistically significant,  $R^2 = .144$ ,  $F(3, 123) = 6.89$ ,  $p < .001$ ). Those with greater support from family and friends reported fewer symptoms of depression ( $b = -2.89$ ,  $p < .001$ ). The effect of peer support was not significant ( $b = .42$ ,  $p = .499$ ). The addition of the two-way interactions in Model 2 (frd/family x peer support; frd/family x TSI; peer support x TSI) yielded a marginally significant interaction of peer support by support from family and friends ( $b = 1.47$ ,  $p = .071$ ; see Table 3). Since this interaction was

hypothesized, I conducted simple effects analyses to assess the extent to which the effect of peer support related to symptoms of depression as a function of friend/family support. Simple effect analyses indicated that the effect of peer support was negative (although not significant) when family support was low (-1 SD) and positive (although not significant) when family support was high (+1 SD). To iterate, these findings should be interpreted with caution as the two-way interaction was only marginally significant. The addition of the three-way interaction to the prediction of symptoms of depression (Model 3) was not significant.<sup>4</sup>

Next, I assessed the extent to which peer and friend/family support predicted subjective well-being. The first model of support from family and friends, peer support, and time since injury to predict subjective well-being was statistically significant,  $R^2 = .086$ ,  $F(3, 121) = 3.79$ ,  $p = .012$ ). Those with greater support from family and friends had higher levels of well-being ( $b = 7.78$ ,  $p = .006$ ). The effect of peer support was not significant ( $b = -.46$ ,  $p = .830$ ). The addition of the two-way interactions in Step 2 (frd/family x peer support; frd/family x TSI; peer support x TSI) to the prediction of subjective well-being were not significant (see Table 4). Furthermore, the addition of the three-way interaction to the prediction of well-being was also not significant.

Finally, I evaluated the extent to which peer and friend/family support predicted reintegration. The first model of support from family and friends, peer support, and time since injury to predict reintegration was statistically significant,  $R^2 = .154$ ,  $F(3, 120) = 7.302$ ,  $p < .001$ ). Individuals with greater support from family and friends scored higher on community reintegration ( $b = .24$ ,  $p = .001$ ). The effect of peer support was not significant ( $b = -.04$ ,  $p = .429$ ). The addition of the two-way interactions in Model 2 (frd/family x peer support; frd/family

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<sup>4</sup> Analyses were repeated using the dichotomized variables (i.e., peer support, family/friend support, and TSI) in a three-way ANOVA. The same pattern of results emerged for all dependent variables (depressive symptoms, subjective well-being, and reintegration).

x TSI; peer support x TSI) to the prediction of reintegration were not significant (see Table 5), nor was the addition of the three-way interaction (frd/family x peer support x TSI).

These regression analyses were repeated replacing friends/family support with social constraints. Model 1 of the analysis to predict symptoms of depression from social constraints, peer support, and time since injury was statistically significant,  $R^2 = .228$ ,  $F(3, 123) = 12.108$ ,  $p < .001$ ). Those who reported greater social constraints reported more symptoms of depression ( $b = 5.12$ ,  $p < .001$ ). The effect of peer support was not significant ( $b = -.02$ ,  $p = .698$ ). As shown in Table 6, the addition of the two-way interactions (frd/family x peer support; frd/family x TSI; peer support x TSI) to the prediction of symptoms of depression (Model 2) were not significant. The addition of the three-way interaction to the prediction of symptoms of depression (Model 3) was also not significant<sup>5</sup>.

Next, I considered whether these variables predicted subjective well-being. The first model of social constraints, peer support, and time since injury to predict subjective well-being was statistically significant,  $R^2 = .149$ ,  $F(3, 121) = 7.06$ ,  $p < .001$ ). Those who reported greater social constraints had lower levels of well-being ( $b = -11.32$ ,  $p < .001$ ). The effect of peer support was not significant ( $b = 1.80$ ,  $p = .264$ ). The addition of the two-way interactions in Model 2 (frd/family x peer support; frd/family x TSI; peer support x TSI) to the prediction of subjective well-being were not significant (see Table 7), nor was the three-way interaction in Model 3.<sup>6</sup>

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<sup>5</sup> The regression analysis was rerun using the dichotomized peer support variable and level of social constraints, while controlling for TSI, and the same pattern of results emerged for symptoms of depression.

<sup>6</sup> The regression analysis was rerun using the dichotomized peer support variable, level of social constraints, and TSI. A slightly different pattern of results emerged for subjective well-being. In Model 1, the effect of peer support was significant ( $b = 3.044$ ,  $p = .043$ ). The two-way interactions in Model 2 were not significant, nor was the three-way interaction in Model 3.

Finally, I evaluated the extent to which these variables (i.e., social constraints, peer support, and time since injury) predicted reintegration. Model 1 which included level of social constraints, peer support, and time since injury to predict reintegration was statistically significant,  $R^2 = .244$ ,  $F(3, 120) = 12.90$ ,  $p < .001$ ). Individuals who reported greater social constraints had poorer reintegration ( $b = -.38$ ,  $p = .001$ ). The effect of peer support was not significant ( $b = .04$ ,  $p = .315$ ). As shown in Table 8, the addition of the two-way interactions to the prediction of reintegration (Model 2) were not significant. Moreover, the addition of the three-way interaction to the prediction of reintegration (Model 3) was also not significant.<sup>7</sup>

### ***Hypothesis 3***

To test the hypothesis that individuals with low quality social support from family and friends (i.e., those with little to no social support or those who experience social constraints) would engage with their peers more frequently and be more satisfied with the peer support they receive than individuals with high quality social support from family and friends, I correlated family/friend support and level of social constraints with the frequency of engagement and level of satisfaction with peer support. This hypothesis was partially supported. The quality of one's social support (i.e., support from family and friends and level of social constraints) was not significantly associated with the frequency of engagement with one's peers (family and friend support,  $r = .06$ ,  $p = .505$ ; social constraints,  $r = .14$ ,  $p = .118$ ). However, individuals with less

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<sup>7</sup> Once again, the regression analysis was rerun using the dichotomized peer support variable and level of social constraints, while controlling for TSI. A slightly different pattern of results emerged in this analysis. In Step 1, the effect of peer support was marginally significant ( $b = .07$ ,  $p = .067$ ), and in Step 2, the interaction between time since injury and peer support was significant ( $b = .15$ ,  $p = .040$ ). Simple effects analyses indicated that the effect of peer support was positive (although not significant) when TSI was low ( $\leq 5$  years) and zero when TSI was high ( $> 5$  years; see Appendix B). The addition of the three-way interaction in Step 3 was not significant.

social support from family and friends were more satisfied with the peer support they received than those reporting more support from family and friends ( $r = -.41, p < .001$ ). The same pattern emerged with individuals who experienced high levels of social constraints in their relationships with family and friends; those who perceived more constraints in their interactions with friends and family were more satisfied with the peer support they received ( $r = .28, p = .001$ ).

#### ***Hypothesis 4***

I also hypothesized that certain aspects of the support one receives from one's peers would be associated with better adjustment, specifically that individuals who engage with their peers more frequently, who receive emotional support from their peers, and who are satisfied with their peer relationship(s) would experience fewer depressive symptoms, higher levels of subjective well-being, less loneliness, and a greater sense of reintegration. In order to test this hypothesis, I conducted a correlational analysis. The frequency of engagement with one's peers and whether the individual received emotional support from their peers were not significantly associated with symptoms of depression, subjective well-being, loneliness, or reintegration ( $-0.10 < r < .16, ps > .070$ ).<sup>8</sup>

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<sup>8</sup> Much like the construct peer support, the emotional support subscale was negatively skewed ( $-0.840$ ), such that most individuals felt emotionally supported by their peers. The variable was dichotomized, and t-tests were run. Individuals who received high emotional support differed significantly from those receiving low emotional support on all adjustment variables of interest. To elaborate, emotional support was significantly associated with symptoms of depression,  $t(132) = 2.07, p = .041$ , loneliness,  $t(130) = 2.21, p = .029$ , subjective well-being,  $t(130) = -2.96, p = .004$ , and reintegration,  $t(129) = -2.55, p = .012$ . Participants who received a higher level of emotional support from their peers experienced significantly fewer symptoms of depression ( $M = 9.86; SD = 6.97$ ) and less loneliness ( $M = 2.48; SD = .94$ ) than individuals who received lower levels of emotional support from their peers ( $M = 12.25; SD = 6.34$  and  $M = 2.85; SD = .97$ , respectively). Likewise, individuals who received a higher level of emotional support from their peers reported higher subjective well-being ( $M = 59.72; SD = 17.84$ ) and were better reintegrated into the community post-injury ( $M = 2.31; SD = .47$ ) than individuals who received a lower level of emotional support from their peers ( $M = 50.92; SD = 16.13$  and  $M = 2.11; SD = .40$ , respectively).

Satisfaction with the peer support one received was significantly associated with fewer symptoms of depression ( $r = -.32, p < .001$ ), less loneliness ( $r = -.35, p < .001$ ), and higher subjective well-being ( $r = .37, p < .001$ ) and better reintegration ( $r = .36, p < .001$ ). Due to the moderate correlation between satisfaction with peer support and each of the indicators of adjustment, I conducted exploratory multiple regression analyses to assess the extent to which satisfaction and support from family and friends uniquely predicted adjustment (i.e., symptoms of depression, subjective well-being, loneliness, and reintegration), while controlling for time since injury.

**Symptoms of depression.** The first model of support from family and friends, satisfaction with peer support, and time since injury to predict symptoms of depression (Model 1) was statistically significant,  $R^2 = .18, F(3, 123) = 9.07, p < .001$ ). Those with greater support from family and friends reported fewer symptoms of depression ( $b = -1.89, p = .016$ ). The effect of satisfaction with peer support was also significant; individuals who reported greater satisfaction with the peer support they receive reported fewer symptoms of depression ( $b = -1.76, p = .008$ ). Time since injury was also significant ( $b = 2.31, p = .041$ ), such that individuals who had their injury for  $\leq 5$  years experienced more depressive symptoms. The addition of the two-way interactions (frd/family x satisfaction; frd/family x TSI; satisfaction x TSI) yielded a significant interaction of satisfaction with peer support by support from family and friends to the prediction of symptoms of depression ( $b = 1.98, p = .013$ ; see Table 9). Simple effect analyses indicated that the effect of satisfaction was negative (approaching significance;  $b = -2.28, p = .0502$ ) when family support was low (1- SD) and essentially zero when family support was high (+1 SD;  $b = .84, p = .406$ ; see Figure 2). The addition of the three-way interaction (frd/family support x satisfaction x TSI) was not significant ( $p = .342$ ).

**Subjective well-being.** Model 1 of support from family and friends, satisfaction with peer support, and time since injury to predict subjective well-being was statistically significant,  $R^2 = .16$ ,  $F(3, 121) = 7.78$ ,  $p < .001$ ). The effect of support from family and friends was not significant ( $b = 3.34$ ,  $p = .106$ ), but the effect of satisfaction with peer support was significant ( $b = 5.87$ ,  $p = .001$ ); individuals who reported greater satisfaction with the peer support they receive reported significantly better well-being. Model 2, with the addition of the two-way interactions to the prediction of subjective well-being, was not significant ( $p = .144$ ), nor was Model 3, with the addition of the three-way interaction ( $p = .607$ ).

**Reintegration.** Model 1 of support from family and friends and satisfaction with peer support to predict reintegration was statistically significant,  $R^2 = .21$ ,  $F(3, 120) = 10.51$ ,  $p < .001$ ). Those with greater support from family and friends were better reintegrated post-injury ( $b = .15$ ,  $p = .003$ ). The effect of satisfaction with peer support was also significant; individuals who reported greater satisfaction with the peer support they receive reported better reintegration ( $b = .13$ ,  $p = .003$ ). The addition of the two-way interactions in Step 2 to the prediction of reintegration were not significant ( $p = .250$ ), nor was the addition of the three-way interaction in Step 3 ( $p = .588$ ).

## Discussion

Despite moderately high levels of depressive symptoms and fairly low levels of subjective well-being, participants in this study had very favorable attitudes towards peer support. By and large, they were quite satisfied with the support that they have received from their peers – even over the course of the COVID-19 pandemic. Most participants also reported very high levels of support from family and non-SCI friends and low levels of social constraints. Despite valuing the peer support highly, peer support was not significantly associated with

symptoms of depression, subjective well-being, loneliness, or community reintegration. In contrast, support from one's family and non-SCI friends was consistently associated with better adjustment across all outcome measures assessed. Likewise, social constraints – when talking with family and non-SCI friends left one feeling misunderstood, unsupported, or rejected – were significantly associated with poorer adjustment across all outcome measures assessed. The data did not support the hypothesized interaction of peer support by family and friend support or peer support by social constraints.

Whereas peer support, as measured by the SCI-PSI, did not predict adjustment, supplemental exploratory analyses indicated that *satisfaction* with peer support did predict all adjustment variables (i.e., symptoms of depression, subjective well-being, and reintegration). The interaction of satisfaction with peer support by family and friend support in predicting depression was significant, such that the impact of satisfaction with peer support depended on the level of support from one's family and friends. Specifically, when support from family and friends was high, the association between satisfaction with peer support and depressive symptoms was essentially zero and when support from family and friends was low, the association between satisfaction and symptoms of depression was negative (approaching significance; i.e., those more satisfied with peer support reported being less depressed than those less satisfied).

Although contrary to my hypotheses, the finding that peer support (as measured by the SCI-PSI) was not significantly associated with indicators of psychological adjustment has been echoed in the peer support literature (Dale et al., 2012; Levy et al., 2019; Sweet et al., 2018). There are several possible explanations for this null result. First, it could be due to an issue of measurement. Although the peer support measure created for this study was more in-depth than

the measures of peer support from previous studies, the SCI-PSI was mainly a measure of received support. In this way, the SCI-PSI did not deviate from past research. Recall that in several studies assessing the impact of peer support on well-being in the SCI context, participants were categorized as having received peer support (mentees) or having not received peer support (non-mentees). Most items on the SCI-PSI (12 out of the 15) assessed support that was received (e.g., you receive practical information from your SCI peers about secondary health conditions) as opposed to the perceived availability of support (3 out of the 15 items, e.g., you know that someone in your condition is always available when you need someone to talk to).

The distinction between *received* support and *perceived* support is important because they are largely unrelated (Dunkel-Schetter & Bennett, 1990). Perhaps not surprisingly, received support, the receipt of specific helping behaviour, is only weakly associated with perceived support, the perception of support availability (Eagle et al., 2019; Haber et al., 2007; Norris & Kaniasty, 1996; Sarason et al., 1987). Social-cognitive theorists posit the discrepancy between received support and perceived support is due to several factors; it is related to characteristics of the receiver, such as individual differences in personality, self-esteem, locus of control, and attitudes toward seeking and accepting help; it is also related to characteristics of the provider, such as individual differences in personality (e.g., agreeableness and emotional stability), interpersonal sensitivity, and perceptiveness; finally, it is also related to characteristics of the provider-receiver relationship, such as the perceived similarity between the provider and receiver (Dunkel-Schetter & Bennet, 1990; Lakey et al., 1996; Lakey et al., 2002).

Furthermore, the objective (received) and subjective (perceived) aspects of support relate to well-being in different ways. Past research has demonstrated that perceived support is more strongly (and consistently) associated with health and well-being than received support (Cohen

& Hoberman, 1983; Helgeson, 1993; Moak & Agrawal, 2010; Uchino, 2009; Wethington & Kessler, 1986) with some studies finding a negative association between received support and well-being (Barrera, 1986; Helgeson, 1993; Komproe et al., 1997).<sup>9</sup> Helgeson (1993) assessed the impact of perceived versus received support on patient and spouse adjustment following a coronary event shortly before the patient was discharged from the hospital and again three months later. She found that regardless of when support was assessed, perceived support was a stronger predictor of adjustment to illness than received support. In addition, the receipt of informational support was associated with more concurrent and subsequent distress. Similarly, Eagle et al. (2019) found that perceived support was more strongly associated with lower levels of depressive symptoms than received support in a sample of United Methodist clergy.

It has been argued that the stronger, more consistent link between perceived support and well-being is because the social support – well-being relation is cognitively mediated and the perceived availability of support may reduce the appraised threat of a given situation (i.e., the stress-buffering hypothesis), in this case the challenges of living with SCI (Cohen & Wills, 1985). Other researchers posit that received support is less likely to be related to well-being simply because it is helping behaviour that has happened (as opposed to helping behaviour that might happen). This is because sometimes support providers want to be helpful but for one reason or another, they are not particularly helpful – maybe even unhelpful. For this reason, received support is at a disadvantage to perceived support. Norris and Kaniasty (1996) suggest

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<sup>9</sup> Note that well-being in the present study was operationalized as the presence of positive affect, the relative absence of negative, and the sense that one's life is satisfying (i.e., the hedonic perspective) as opposed to psychological well-being (i.e., the eudaimonic perspective). If one approaches well-being from a eudaimonic perspective, research has demonstrated that the receipt of peer support fosters other positive outcomes related to well-being following SCI, such as increases in self-efficacy (Ljungberg et al., 2011).

that collateral factors of the helping process, defined as “the psychologically complicated nuts and bolts of helping...” (p. 499), such as the timing of support, whether the type of support is appropriate, or if its delivery is adequate, may create disappointment with actual support exchanges. For example, it may be that the loss of in-person peer support and the shift to online peer support at the onset of COVID-19 has impacted the effectiveness of the support being provided.

Yet another consideration important to the received-perceived support – well-being discrepancy is individual differences in the need for support. In the present study, I hypothesized that the relation between peer support and adjustment would be stronger for individuals with poorer quality support from family and non-SCI friends. This hypothesis was based on the assumption that individuals with low quality support from family and non-SCI friends may have a greater need for support, but this may not be the case. Melrose and colleagues (2015) found that adding a measure of the need for support strengthened the relation between received support and perceived support (from an average correlation of .28 to .54), as well as the relation between received support and well-being (from an average correlation of .04 to .31) in a community sample. Individual differences in support needs for persons living with SCI may be largely unrelated to social factors, such as the level of perceived support from family and friends, as much as individual factors, such as personality, threat appraisal, and coping behaviour. That said, the novel finding that when friend and family support was low satisfaction had a marginally significant negative association with symptoms of depression, suggests more research is needed to better understand the interplay between the support from close others and support from one’s peers.

Although the SCI-PSI was not associated with adjustment in the present study, the level of *satisfaction* with peer support was associated with all indicators of adjustment; individuals who reported greater satisfaction with the peer support they receive reported fewer symptoms of depression, higher subjective well-being, and better community reintegration. This finding is noteworthy because although some researchers define perceived support as the perception of available support, others rely on a broader definition of perceived support which encompasses how one evaluates provided support (i.e., how satisfied one is with the support they receive and/or the adequacy of provided support; Barrera, 1986; Melrose et al., 2015; Sarason et al., 1990). If perceived support is conceptualized in this way the findings in the present study are in line with past research. For example, Barrera (1981, as cited in Barrera, 1986) found that support satisfaction was related to lower levels of psychological distress in a sample of pregnant adolescents. Similarly, Henderson and colleagues (1981, as cited in Barrera, 1986) found the perceived adequacy of social support was associated with fewer symptoms of depression and lower levels of psychological distress among individuals who had experienced adverse life events. Conceptualizing *satisfaction* as a component of perceived support also helps resolve the weak correlations that were found between the level of satisfaction with peer support and the measures of received support, namely the SCI-PSI ( $r = .21, p = .013$ ) and the frequency of contact with one's SCI peers ( $r = .29, p = .001$ ) in the present study.

### **Limitations and Future Directions**

Some limitations of this study should be considered. First, the data are cross-sectional, so the issue of causality remains ambiguous. For example, it is possible that greater satisfaction with the support one receives predicts better well-being, as was suggested in the present study, but it is equally possible that people who are happier tend to perceive the support they receive as

more satisfying. That said, Krause and colleagues (1989) demonstrated that changes in satisfaction with social support preceded changes in symptoms of depression in a community sample of older adults. Yet another study found that perceived support predicted depression severity and depression recovery at a 6-month follow-up among individuals who met the diagnostic criteria for major depression (Lara et al., 1997). More recently, Prevatt and colleagues (2018) examined the efficacy of a peer support intervention for women experiencing postpartum depression. They found, much like in the present study, that perceptions of peer support were very positive, and satisfaction with the peer support intervention was high ( $M = 3.5$ , which corresponded with mostly satisfied to very satisfied). Women who participated in the peer support intervention experienced a significant reduction in depressive symptoms at follow-up.

It is also possible that other variables could be influencing the results that were not accounted for, such as the psychosocial challenges associated with the COVID-19 pandemic. Data collection for the present study took place from December 23<sup>rd</sup>, 2020, to April 14<sup>th</sup>, 2021. During this time in-person gatherings were strongly discouraged because of the prevalence of the COVID-19 virus, especially for individuals who were immunocompromised, so all peer support programs shifted online. In addition to social restrictions, this was a time of uncertainty for many, with food, housing, and employment hardship peaking in December 2020 in the US (Center on Budget and Policy Priorities [CBPP], 2021). In a pair of studies conducted in the United States and Israel, Hertz-Palmore et al. (2021) found that income loss and financial strain were related to more symptoms of depression, even when anxiety, worries about one's health, and pre-COVID-19 income were accounted for. Moreover, further loss of income was associated with an increase in depressive symptoms at a 1-month follow-up. They also found that an

increase in subjective financial strain was associated with an increase in symptoms of depression at the 1-month follow-up, but only among US participants.

Given the widespread (and variable) social, psychological, and economic impacts of the COVID-19 pandemic, it is important to recognize that it may have affected the results of this study (e.g., the relatively low well-being of the sample).<sup>10</sup> Conversely, the timing of this study could also be considered a strength as I was able to collect data on how the COVID-19 pandemic had affected participant's peer relationships and report on the perceived changes in peer support, such as changes in the frequency of contact, changes in the method of support delivery, and changes in how participants value their peer relationships. It is encouraging that participants reported being satisfied with the support they were receiving in spite of the shift to virtual and telephone communication and that a number of participants reported qualitatively that the value of peer support had increased.

Another limitation of utilizing a cross-sectional design is the inability to observe changes in well-being over time. Although participants in this study reported moderately high levels of depressive symptoms and relatively low levels of subjective well-being, it may be that they were doing worse before receiving support from their peers and that improvement was not captured. In order to test the effectiveness of community peer support, it will be important to evaluate peer support prospectively so that researchers can compare levels of well-being before beginning peer support with levels of well-being after peer support has begun, as was done in the Prevatt et al.

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<sup>10</sup> For example, a recent SCI study utilizing a Canadian sample (Davis & Novoa, 2013) using the same measure of subjective well-being reported an average subjective well-being score of 65% of maximum possible whereas the average subjective well-being score for this sample was 56% of maximum possible. Although there could be other factors at play, such as geographic location and the provision of basic health care (as roughly 70% of this sample was from the US), it is interesting to note the considerably lower level of subjective well-being in the present study.

(2018) study. Moreover, for a study of this magnitude, it may be advantageous to narrow the definition of community peer support to those individuals who have been paired with a peer mentor who has received some form of training through an SCI organization.

Furthermore, assessing peer support utilizing a dyadic approach, to capture both the impact on the provider (mentor) and receiver (mentee), could provide a wealth of information about the reciprocity of peer relationships. For example, a recent evaluation of community peer support programs in Canada found that mentors reported several benefits to mentoring others with SCI: enhanced emotional well-being, an improved sense of purpose, increased feelings of relatedness, and improved motivation and self-confidence (Shaw et al., 2019). That said, mentors also reported some negative outcomes, such as feeling helpless and tired, and feelings of failure. These qualitative mentor reports have yet to be tested quantitatively. Finally, a dyadic approach would also provide researchers the opportunity to evaluate the conditions under which peer support is most effective, such as provider-receiver similarity as proposed by social-cognitive theorists (Lakey et al., 1996; Lakey et al., 2002).

### **Implications for Practice**

Considered as a whole, my results are consistent with the view that perceived support is more consequential than received support when it comes to the well-being of those who have acquired an SCI (as it has been conceptualized here). Interventions which target perceptions of peer availability may be worth investigating with this population. Brand and colleagues (1995) tested the efficacy of a psychoeducational intervention to increase perceptions of social support in a community sample of individuals who had low perceived support. After completing 13 weekly sessions focusing on social skills training and cognitive restructuring, participants in the treatment condition experienced an increase in perceived familial support, but not perceived

friend support. The observed changes in perceived family support were fully mediated by changes in self-esteem and self-reinforcement, which suggests that positive perceptions about the self may be an important component of support perceptions. Although the generalizability of this study to the current sample is limited (e.g., individuals with mental illness were excluded, the study focused on family support, and no follow-up data were collected so it is possible the effects of the intervention were not long-lasting), social-cognitive interventions provide a promising avenue for future research.

Finally, it may be advisable for SCI organizations to monitor new mentees once peer relationships have been initiated to determine whether the individual feels supported, how the support is meeting their needs (e.g., needs-fit model), and their level of satisfaction with the peer support they are receiving. In a recent evaluation of community peer programs affiliated with SCI Canada, Shaw et al. (2019) revealed that only six out of the nine organizations surveyed track peer mentoring outcomes; six organizations track mentor outcomes, and five track mentee outcomes, citing that most organizations do not have the resources to collect this type of data (i.e., mentee data). Similarly, in the United States, The Spinal Network (a chapter of the United Spinal Association) also tracks mentee outcomes (such as objectives, goals, and progress), but only from the perspective of mentors; the mentees do not directly provide feedback to the organization (R. Hayden, personal communication, August 8, 2021).

## **Conclusion**

Individuals with SCI are faced with many psychosocial adjustment challenges and peer support is commonly recommended to those who are newly injured. Whereas prior studies have indicated that the relation between peer support and well-being is inconsistent, this study shows that this may be due to an issue of measurement. Although *received* peer support, as measured by

the SCI-PSI, was not associated with adjustment, *perceived* peer support, as measured by the level of satisfaction with the peer support one receives, was associated with all indicators of adjustment. Individuals who were more satisfied with the peer support they received exhibited fewer symptoms of depression, had higher levels of subjective well-being, experienced less loneliness, and exhibited better community reintegration. More research, particularly of a longitudinal design, is needed to better understand the adjustment trajectory of individuals with SCI who receive support from their peers.

**Table 1***Mean Scores for the Spinal Cord Injury Peer Support Inventory (SCI-PSI)*

Item	<i>M(SD)</i>
Your SCI peers share their personal experience with spinal cord injury. [P]	3.80(1.37)
You feel that you understand your spinal cord injury better because of your relationships with your SCI peers. [P]	3.64(1.22)
Your SCI peers are an inspiration to you. [I]	3.67(1.22)
You receive helpful information about spinal cord injury management from your SCI peers. [P]	3.87(1.16)
You know that someone in your condition is always available when you need someone to talk to. [E]	3.56(1.37)
You feel a sense of connection with your SCI peers. [E]	3.84(1.22)
You feel reassured by your SCI peers about how to direct your care. [P]	3.46(1.15)
You feel more in control of your life because of the support you receive from your SCI peers. [I]	3.46(1.15)
You can talk about your SCI-related concerns with your SCI peers. [E]	4.12(1.19)
Your SCI peers have helped you realize that your life – even though it may be different – can be meaningful. [I]	3.65(1.32)
You can discuss worrying thoughts and emotions with your SCI peers. [E]	3.81(1.28)
You feel reassured about your personhood by your SCI peers. [I]	3.64(1.14)
You receive practical information from your SCI peers about secondary health conditions. [P]	3.84(1.15)
You receive support from your SCI peers about coping with your losses. [E]	3.41(1.22)
Your SCI peers have helped you regain a sense of purpose in your life. [I]	3.37(1.18)

*Note.* Scores ranged from 1 = ‘strongly disagree’, to 3 = ‘neither agree nor disagree’ to 5 = ‘strongly agree.’ P = practical support item; E = emotional support item; I = identity-changing influence item.

**Table 2***Correlations Between Dependent and Independent Variables*

Variable (Range)	Mean (SD)	1	2	3	4	5	6
1. Perceived Social Support (MSPSS; 1-5)	4.15 (.79)	-					
2. Social Constraints (SCS; 1-4)	2.26 (.59)	-.45**	-				
3. Peer Support (1-5)	3.67 (.94)	.21*	.06	-			
4. Depressive Symptoms (0-30)	10.95 (6.77)	-.35**	.45**	-.03	-		
5. Subjective Well-Being (0-100)	55.59 (17.55)	.29**	-.36**	.09	-.79**	-	
6. Loneliness (1-5)	2.66 (.97)	-.50**	.48**	-.04	.56**	-.55**	-
7. Reintegration (0-2)	1.21 (.45)	.39**	-.47**	.07	-.59**	.67**	-.54**

*Note.*  $N = 135$ .\* $p < .05$ , \*\* $p < .001$  (two-tailed).

**Table 3**

*Regression of Symptoms of Depression on Peer Support, Support from Family and Friends, and Time Since Injury.*

Predictor	Dependent Variable: Symptoms of Depression				
	<i>b</i>	<i>se</i>	<i>t(df= 120)</i>	<i>p</i>	95% CI for <i>b</i>
Constant	9.655	.79	12.25	<.001	8.095, 11.216
Peer Support (PS)	.002	.79	.00	.998	-1.553, 1.556
Family and Friend Support (FS)	-2.451	1.04	-2.36	.020	-4.507, -.395
Time Since Injury (TSI)	2.311	1.16	2.00	.048	.024, 4.598
PS X FS	1.470	.81	1.82	.071	-.125, 3.065
TSI X PS	.162	1.35	.12	.905	-2.511, 2.834
TSI X FS	-.411	1.51	-.27	.786	-3.405, 2.583

*Note.*  $N = 127$ .

Simple effect analyses for Peer Support by Family Support:

When Family Support is low (-1 SD):  $b_0 = 11.616$ ,  $b_1 = -1.174$ ,  $se = 1.16$ ,  $t = -1.01$ ,  $p = 0.314$

When Family Support is high (+1 SD):  $b_0 = 7.694$ ,  $b_1 = 1.178$ ,  $se = .85$ ,  $t = 1.39$ ,  $p = 0.167$

**Table 4***Regression of Subjective Well-Being on Peer Support, Support from Family and Friends, and Time Since Injury.*

Predictor	Dependent Variable: Subjective Well-Being				
	<i>b</i>	<i>se</i>	<i>t(df = 118)</i>	<i>p</i>	95% CI for <i>b</i>
Constant	56.852	2.124	26.77	<.001	52.646, 61.059
Peer Support (PS)	-.455	2.117	-.22	.830	-4.647, 3.737
Family and Friend Support (FS)	7.783	2.799	2.78	.006	2.240, 13.326
Time Since Injury (TSI)	-2.520	3.148	-.80	.425	-8.754, 3.715
PS X FS	-1.784	2.182	-.82	.415	-6.106, 2.538
TSI X PS	3.821	3.698	1.03	.304	-3.502, 11.145
TSI X FS	-4.319	4.082	-1.06	.292	-12.403, 3.765

*Note.* *N* = 125.

**Table 5***Regression of Reintegration on Peer Support, Support from Family and Friends, and Time Since Injury.*

Predictor	Dependent Variable: Reintegration				
	<i>b</i>	<i>se</i>	<i>t(df = 117)</i>	<i>p</i>	95% CI for <i>b</i>
Constant	1.242	.053	23.56	<.001	1.138, 1.347
Peer Support (PS)	-.042	.052	-.79	.429	-.145, .062
Family and Friend Support (FS)	.237	.070	3.39	.001	.099, .375
Time Since Injury (TSI)	-.042	.078	-.54	.588	-.197, .112
PS X FS	-.019	.054	-.35	.725	-.126, .088
TSI X PS	.112	.091	1.22	.223	-.069, .293
TSI X FS	-.038	.101	-.38	.707	-.239, .162

*Note.* *N* = 124.

**Table 6***Regression of Symptoms of Depression on Peer Support, Social Constraints, and Time Since Injury.*

Predictor	Dependent Variable: Symptoms of Depression				
	<i>b</i>	<i>se</i>	<i>t(df = 120)</i>	<i>p</i>	95% CI for <i>b</i>
Constant	10.129	.736	13.759	<.001	8.672, 11.587
Peer Support (PS)	-.331	.720	-.46	.647	-1.756, 1.094
Social Constraints (SCS)	4.149	1.105	3.76	<.001	1.961, 6.338
Time Since Injury (TSI)	1.725	1.098	1.57	.119	-.450, 3.900
PS X SCS	-1.137	.910	-1.25	.214	-2.939, .655
TSI X PS	-.469	1.254	-.37	.709	-2.952, 2.015
TSI X SCS	3.280	2.011	1.63	.106	-.702, 7.263

*Note.* *N* = 127.

**Table 7***Regression of Subjective Well-Being on Peer Support, Social Constraints, and Time Since Injury.*

Predictor	Dependent Variable: Subjective Well-Being				
	<i>b</i>	<i>se</i>	<i>t(df = 118)</i>	<i>p</i>	95% CI for <i>b</i>
Constant	56.158	2.031	27.64	<.001	52.135, 60.181
Peer Support (PS)	.587	1.987	.30	.768	-3.347, 4.522
Social Constraints (SCS)	-10.424	3.050	-3.42	.001	-16.463, -4.385
Time Since Injury (TSI)	-1.297	3.064	-.42	.673	-7.365, 4.771
PS X SCS	.487	2.529	.19	.848	-4.521, 5.495
TSI X PS	4.641	3.555	1.31	.194	-2.399, 11.681
TSI X SCS	-3.936	5.803	-.68	.499	-15.429, 7.556

*Note.* *N* = 125.

**Table 8***Regression of Reintegration on Peer Support, Social Constraints, and Time Since Injury.*

Predictor	Dependent Variable: Reintegration				
	<i>b</i>	<i>se</i>	<i>t(df = 117)</i>	<i>p</i>	95% CI for <i>b</i>
Constant	1.223	.049	25.16	<.001	1.126, 1.319
Peer Support (PS)	.008	.047	.18	.860	-.086, .102
Social Constraints (SCS)	-.341	.073	-4.70	<.001	-.484, -.197
Time Since Injury (TSI)	-.008	.073	-.11	.910	-.153, .136
PS X SCS	.059	.060	.98	.329	-.060, .178
TSI X PS	.149	.085	1.76	.081	-.019, .317
TSI X SCS	-.164	.138	-1.19	.236	-.438, .109

*Note.* *N* = 124.

**Table 9**

*Regression of Symptoms of Depression on Satisfaction with Peer Support, Support from Family and Friends, and Time Since Injury.*

Predictor	Dependent Variable: Symptoms of Depression				
	<i>b</i>	<i>se</i>	<i>t</i> ( <i>df</i> = 120)	<i>p</i>	95% CI for <i>b</i>
Constant	9.164	.788	11.63	<.001	7.604, 10.723
Satisfaction	-.720	.892	-.81	.421	-2.487, 1.047
Family and Friend Support (FS)	-2.074	1.070	-1.94	.055	-4.192, .043
Time Since Injury (TSI)	2.525	1.095	2.31	.023	.357, 4.694
Satisfaction X FS	1.978	.781	2.53	.013	.431, 3.525
TSI X Satisfaction	-1.509	1.323	-1.14	.256	-4.128, 1.109
TSI X FS	-.061	1.567	-.04	.969	-3.163, 3.041

*Note.* *N* = 127.

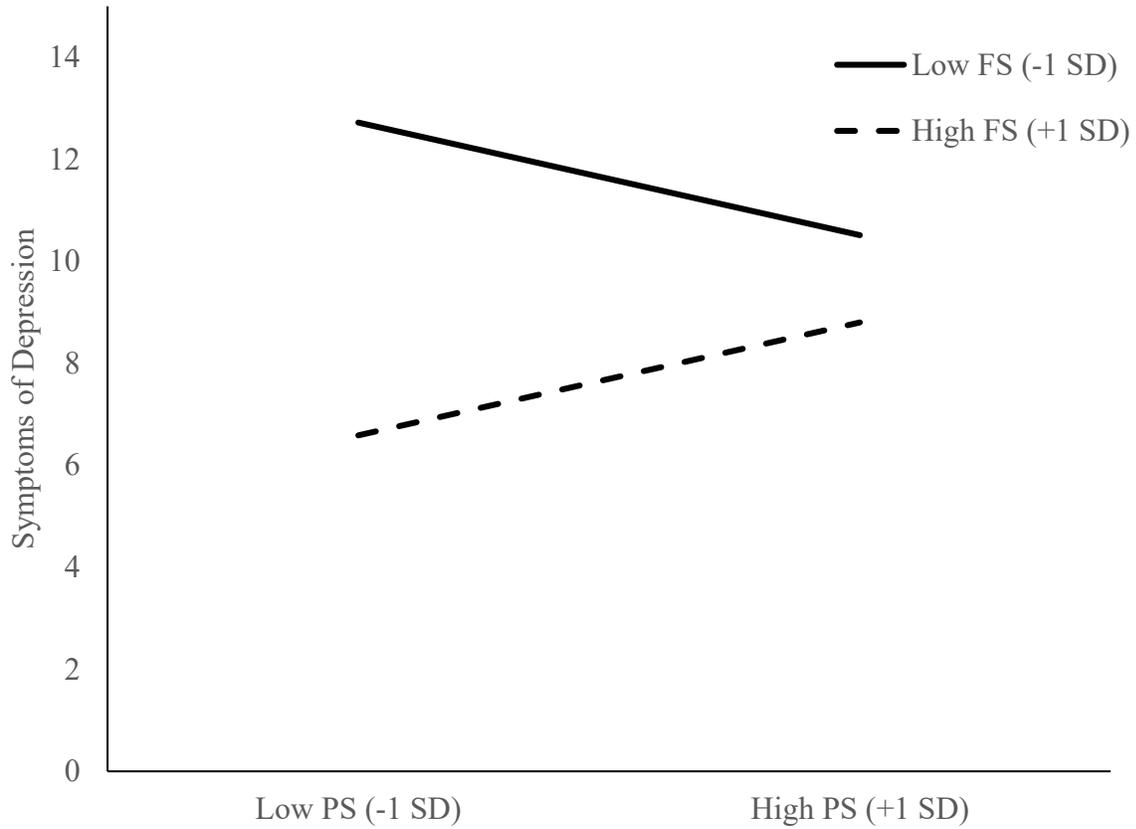
Simple effect analyses for Level of Satisfaction with Peer Support by Family Support:

When Family Support is low (-1 SD):  $b_0 = 10.803$ ,  $b_1 = -2.283$ ,  $se = 1.15$ ,  $t = -1.98$ ,  $p = 0.050$

When Family Support is high (+1 SD):  $b_0 = 7.526$ ,  $b_1 = 0.843$ ,  $se = 1.01$ ,  $t = 0.83$ ,  $p = 0.406$

**Figure 1**

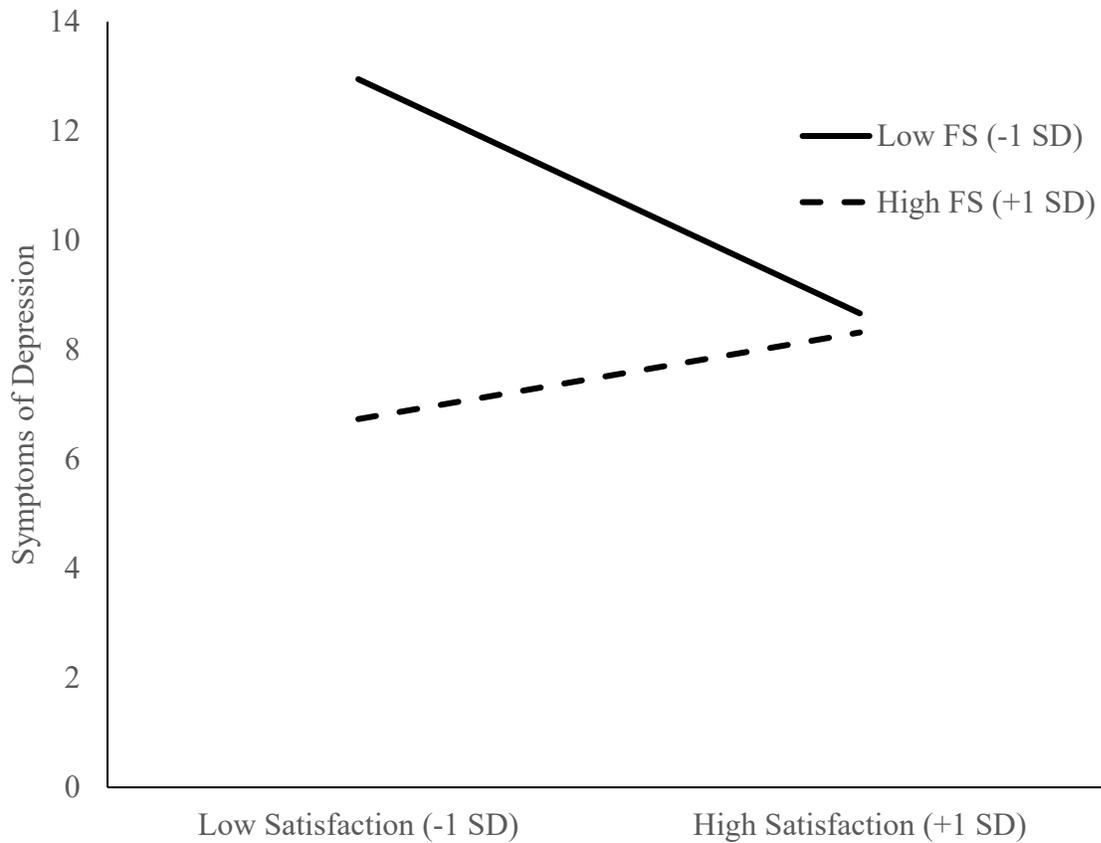
*The Moderating Role of Support from Family and Friends (FS) on the Relation Between Peer Support (PS) and Symptoms of Depression*



*Note.* This figure demonstrates the extent to which peer support was associated with symptoms of depression as a function of friend and family support. The association of peer support with symptoms of depression was negative (although not significant) when friend and family support was low (-1 SD) and positive (although not significant) when friend and family support was high (+1 SD).

**Figure 2**

*The Moderating Role of Support from Family and Friends (FS) on the Relation Between Satisfaction with Peer Support and Symptoms of Depression*



*Note.* This figure demonstrates the extent to which satisfaction with one's peer support was associated with symptoms of depression as a function of support from one's family and friends. The association of satisfaction with depressive symptoms was negative (marginally significant) when friend and family support was low (-1 SD) and essentially zero when friend and family support was high (+1 SD).

## References

- Barrera, M. (1986). Distinctions between social support concepts, measures, and models. *American Journal of Community Psychology, 14*(4), 413–445.
- Beedie, A., & Kennedy, P. (2002). Quality of social support predicts hopelessness and depression post spinal cord injury. *Journal of Clinical Psychology in Medical Settings, 9*, 227–234. doi:10.1023/A:1016003428370
- Björgvinsson, T., Kertz, S.J., Bigda-Peyton, J.S., McCoy, K.L., Aderka, I.M. (2013). Psychometric properties of the CES-D-10 in a psychiatric sample. *Assessment, 20*, 429-436.
- Bonanno, G. A., Kennedy, P., Galatzer-Levy, I. R., Lude, P., & Elfström, M. L. (2012). Trajectories of resilience, depression, and anxiety following spinal cord injury. *Rehabilitation Psychology, 57*(3), 236-247.
- Borregaard, B., & Ludvigsen, M. (2018). Exchanging narratives—A qualitative study of peer support among surgical lung cancer patients. *Journal of Clinical Nursing, 27*(1-2), 328–336. doi:10.1111/jocn.13903
- Brand, E. F., Lakey, B., & Berman, S. (1995). A preventive, psychoeducational approach to increase perceived social support. *American Journal of Community Psychology, 23*(1), 117–135. <https://doi.org/10.1007/BF02506925>
- Burg, M. & Seeman, T. (1994). Families and health: The negative side of social ties. *Annals of Behavioral Medicine, 16*(2), 109-115. doi: 10.1093/abm/16.2.109
- Campbell, H. S., Phaneuf, M. R., & Deane, K. (2004). Cancer peer support programs—do they work? *Patient Education and Counseling, 55*(1), 3-15.

- Cecil, H., Stanley, M., Carrion, P., & Swann, A. (1995). Psychometric properties of the MSPSS and NOS in psychiatric outpatients. *Journal of Clinical Psychology, 51*(5), 593–602. doi:10.1002/1097-4679(199509)51:5<593::AID-JCLP2270510503>3.0.CO;2-W
- Center on Budget and Policy Priorities. (2021). *Tracking the COVID-19 Recession's Effects on Food, Housing, and Employment Hardships*. <https://www.cbpp.org/research/poverty-and-inequality/tracking-the-covid-19-recessions-effects-on-food-housing-and>
- Cohen, P., Cohen, J., Aiken, L. S., & West, S. G. (1999). The problem of units and the circumstance for POMP. *Multivariate Behavioral Research, 34*, 315–346. doi:10.1207/S15327906MBR3403\_2
- Cohen, S., & Hoberman, H. M. (1983). Positive events and social supports as buffers of life change stress. *Journal of Applied Social Psychology, 13*(2), 99–125.
- Cohen, S., & Wills, T. A. (1985). Stress, social Support, and the buffering hypothesis. *Psychological Bulletin, 98*(2), 310–357.
- Cordova, M., Giese-Davis, J., Golant, M., Kronenwetter, C., Chang, V., & Spiegel, D. (2007). Breast cancer as trauma: Posttraumatic stress and posttraumatic growth. *Journal of Clinical Psychology in Medical Settings, 14*(4), 308–319. doi:10.1007/s10880-007-9083-6
- Cordova, M. J., Walser, R., Neff, J., Ruzek, J. I., (2005). Predictors of emotional adjustment following traumatic injury: Personal, social, and material resources. *Prehospital and Disaster Medicine, 20*(1), 7–13.
- Dale, J., Williams, S., & Bowyer, V. (2012). What is the effect of peer support on diabetes outcomes in adults? A systematic review. *Diabetic Medicine, 29*(11), 1361–1377. doi:10.1111/j.1464-5491.2012.03749.x

- Davis, C. G., & Novoa, D. C. (2013). Meaning-making following spinal cord injury: Individual differences and within person change. *Rehabilitation Psychology, 58*, 166-177.
- Davis, C. G., & Porter, J. E. (2018). Pathways to growth following trauma and loss. In C.R. Snyder, S. J. Lopez, L. M. Edwards, and S. C. Marques, (Eds.) *Oxford Handbook of Positive Psychology, 3rd Ed.* New York: Oxford University Press.
- Dickson, A., Ward, R., O'Brien, G., Allan, D., & O'Carroll, R. (2011). Difficulties adjusting to post-discharge life following a spinal cord injury: An interpretative phenomenological analysis. *Psychology, Health & Medicine, 16*(4), 463–474.  
doi:10.1080/13548506.2011.555769
- Diener, E. (1984). Subjective well-being. *Psychological Bulletin, 95*(3), 542-575. doi: 10.1037//0033-2909.95.3.542
- Diener, E., Emmons, R., Larsen, R., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment, 49*(1), 71–75. doi:10.1207/s15327752jpa4901\_13
- Dunkel-Schetter, C., & Bennett, T. L. (1990). Differentiating the cognitive and behavioral aspects of social support. In B. R. Sarason, I. G. Sarason, & G. R. Pierce (Eds.), *Social support: An interactional view* (pp. 267-296). New York: John Wiley and Sons.
- Eagle, D. E., Hybels, C. F., & Proeschold-Bell, R. J. (2019). Perceived social support, received social support, and depression among clergy. *Journal of Social and Personal Relationships, 36*(7), 2055–2073.
- Eker, D., & Arkar, H. (1995). Perceived social support: psychometric properties of the MSPSS in normal and pathological groups in a developing country. *Social Psychiatry and Psychiatric Epidemiology, 30*(3), 121–126. doi:10.1007/BF00802040

- Gifre, M., del Valle, A., Gil, À., & Monreal, P. (2014). The experience of identity transformation process for people living with tetraplegia and paraplegia. *Anuario de Psicología*, 44(3), 361-372.
- Haas, B. M., Price, L. & Freeman, J. A. (2012). Qualitative evaluation of a community peer support service for people with spinal cord injury. *Spinal Cord*, 51(4), 295–299.  
doi:10.1038/sc.2012.143
- Haber, M. G., Cohen, J. L., Lucas, T., & Baltes, B. B. (2007). The relationship between self-reported received and perceived social support: A meta-analytic review. *American Journal of Community Psychology*, 39(1), 133–144.
- Helgeson, V. S. (1993). Two important distinctions in social support: Kind of support and perceived versus received. *Journal of Applied Social Psychology*, 23(10), 825–845.
- Helgeson, V., Cohen, S., Schulz, R., & Yasko, J. (1999). Education and peer discussion group interventions and adjustment to breast cancer. *Archives of General Psychiatry*, 56(4), 340–347. doi:10.1001/archpsyc.56.4.340
- Helgeson, V., Cohen, S., Schulz, R., & Yasko, J. (2000). Group support interventions for women with breast cancer: who benefits from what? *Health Psychology*, 19(2), 107–114.  
doi:10.1037/0278-6133.19.2.107
- Helgeson, V., Cohen, S., Schulz, R., & Yasko, J. (2001). Long-term effects of educational and peer discussion group interventions on adjustment to breast cancer. *Health Psychology*, 20(5), 387–392. doi:10.1037//0278-6133.20.5.387
- Hertz-Palmor, N., Moore, T. M., Gothelf, D., DiDomenico, G. E., Dekel, I., Greenberg, D. M., Brown, L. A., Matalon, N., Visoki, E., White, L. K., Himes, M. M., Schwartz-Lifshitz, M., Gross, R., Gur, R. C., Gur, R. E., Pessach, I. M., & Barzilay, R. (2021). Association

- among income loss, financial strain and depressive symptoms during COVID-19: Evidence from two longitudinal studies. *Journal of Affective Disorders*, 291, 1–8.
- Herzer, M., Zakowski, S. G., Flanigan, R., & Johnson, P. (2006). The relationship between threat appraisal and social constraints in cancer survivors and their spouses. *Journal of Behavioral Medicine*, 29, 549–560.
- Hitzig, S., Romero Escobar, E., Noreau, L., & Craven, B. (2012). Validation of the Reintegration to Normal Living Index for community-dwelling persons with chronic spinal cord injury. *Archives of Physical Medicine and Rehabilitation*, 93(1), 108–114.  
doi:10.1016/j.apmr.2011.07.200
- Hoey, L. M., Ieropoli, S. C., White, V. M., & Jefford, M. (2008). Systematic review of peer-support programs for people with cancer. *Patient education and counseling*, 70(3), 315-337.
- Hughes, M., Waite, L., Hawkey, L., & Cacioppo, J. (2004). A short scale for measuring loneliness in large surveys: Results from two population-based studies. *Research on Aging*, 26(6), 655–672. doi:10.1177/0164027504268574
- Ingram, K., Betz, N., Mindes, E., Schmitt, M., & Smith, N. (2001). Unsupportive responses from others concerning a stressful life event: Development of the unsupportive social interactions inventory. *Journal of Social and Clinical Psychology*, 20(2), 173–207.  
doi:10.1521/jscp.20.2.173.22265
- Institute of Medicine. (2014). *Capturing social and behavioral domains and measures in electronic health records: Phase 2*. Washington, DC: The National Academies Press.
- Kessler, D., Egan, M., & Kubina, L. (2014). Peer support for stroke survivors: A case study. *BMC Health Services Research*, 14(1), 256–256. doi:10.1186/1472-6963-14-256

- Komproe, I. H., Rijken, M., Ros, W. J. ., Winnubst, J. A. ., & `tHart, H. (1997). Available support and received support: Different effects under stressful circumstances. *Journal of Social and Personal Relationships*, *14*(1), 59–77.
- Koutrouli, N., Anagnostopoulos, F., Tsikkinis, A., Papastylianou, D., & Lepore, S. (2016). Psychometric properties of the Greek version of the Social Constraints Scale in a sample of women with breast cancer. *Women & Health*, *56*(4), 413–427.  
doi:10.1080/03630242.2015.1101746
- Kramer, J., Rubin, A., Coster, W., Helmuth, E., Hermos, J., Rosenbloom, D., ... & Lachowicz, M. (2014). Strategies to address participant misrepresentation for eligibility in Web-based research. *International Journal of Methods in Psychiatric Research*, *23*(1), 120-129.
- Krause, J. & Carter, R., E. (2009). Risk of mortality after spinal cord injury: relationship with social support, education, and income. *Spinal Cord*, *47*(8), 592–596.
- Krause, N., Liang, J., & Yatomi, N. (1989). Satisfaction with social support and depressive symptoms: A panel analysis. *Psychology and Aging*, *4*(1), 88–97.
- Lakey, B., Adams, K., Neely, L., Rhodes, G., Lutz, C. J., & Sielky, K. (2002). Perceived support and low emotional distress: The role of enacted support, dyad similarity, and provider personality. *Personality & Social Psychology Bulletin*, *28*(11), 1546–1555.
- Lakey, B., McCabe, K. M., Fiscaro, S. A., & Drew, J. B. (1996). Environmental and personal determinants of support perceptions: Three generalizability studies. *Journal of Personality and Social Psychology*, *70*(6), 1270–1280.
- Laksmi, O., Chung, M., Liao, Y., & Chang, P. (2020). Multidimensional Scale of Perceived Social Support in Indonesian adolescent disaster survivors: A psychometric evaluation. *PloS One*, *15*(3), 1-12. doi:10.1371/journal.pone.0229958

- Lara, M. E., Leader, J., & Klein, D. N. (1997). The association between social support and course of depression: Is it confounded with personality? *Journal of Abnormal Psychology, 106*(3), 478–482.
- LaVela, S., Etingen, B., Miskevics, S., & Heinemann, A. (2019). What determines low satisfaction with life in individuals with spinal cord injury? *The Journal of Spinal Cord Medicine, 42*(2), 236–244. doi:10.1080/10790268.2018.1466480
- Lehman, D., Ellard, J., & Wortman, C. (1986). Social support for the bereaved: Recipients' and providers' perspectives on what is helpful. *Journal of Consulting and Clinical Psychology, 54*(4), 438–446. doi:10.1037/0022-006X.54.4.438
- Lepore, S. J., & Helgeson, V. S. (1998). Social constraints, intrusive thoughts, and mental health after prostate cancer. *Journal of Social and Clinical Psychology, 17* (1), 89–106.
- Lepore, S. J., & Ituarte, P. H. G. (1999). Optimism about cancer enhances mood by reducing negative social interactions. *Cancer Researcher Therapeutics Control, 8*, 165–74.
- Lepore, S., & Revenson, T. (2007). Social constraints on disclosure and adjustment to cancer. *Social and Personality Psychology Compass, 1*(1), 313–333. doi:10.1111/j.1751-9004.2007.00013.x
- Levy, B., Luong, D., Perrier, L., Bayley, M., & Munce, S. (2019). Peer support interventions for individuals with acquired brain injury, cerebral palsy, and spina bifida: a systematic review. *BMC Health Services Research, 19*(1), 288–11. doi:10.1186/s12913-019-4110-5
- Ljungberg, I., Kroll, T., Libin, A., & Gordon, S. (2011). Using peer mentoring for people with spinal cord injury to enhance self-efficacy beliefs and prevent medical complications. *Journal of Clinical Nursing, 20*(3-4), 351–358.

- McCombs, N., Curry, S., Engel, E., & Ehrlich-Jones, L. (2020). Measurement characteristics and clinical utility of the Reintegration to Normal Living Index among persons with spinal cord injuries. *Archives of Physical Medicine and Rehabilitation, 101*(2), 395–396. doi:10.1016/j.apmr.2019.11.004
- Mead, S., Hilton, D., & Curtis, L. (2001). Peer support: A theoretical perspective. *Psychiatric Rehabilitation Journal, 25*(2), 134–141. doi:10.1037/h0095032
- Melrose, K. L., Brown, G. D. ., & Wood, A. M. (2015). When is received social support related to perceived support and well-being? When it is needed. *Personality and Individual Differences, 77*, 97–105.
- Mens, M. G., Helgeson, V. S., Lembersky, B. C., Baum, A., & Scheier, M. F. (2016). Randomized psychosocial interventions for breast cancer: impact on life purpose. *Psycho-oncology, 25*(6), 618-625.
- Migliorini, C., Tonge, B., & Taleporos, G. (2008). Spinal cord injury and mental health. *Australian & New Zealand Journal of Psychiatry, 42*(4), 309-314.
- Miller, W.C., Anton, H.A., Townson, A. F. (2008). Measurement properties of the CESD scale among individuals with spinal cord injury. *Spinal Cord, 46*, 287-292.
- Moak, Z. B., & Agrawal, A. (2010). The association between perceived interpersonal social support and physical and mental health: results from the national epidemiological survey on alcohol and related conditions. *Journal of Public Health, 32*(2), 191–201. <https://doi.org/10.1093/pubmed/fdp093>
- Mothabeng, D., Eksteen, C., & Westaway, M. (2012). Psychometric validation of the reintegration to normal living index in people living with spinal cord injuries. *The South African Journal of Physiotherapy, 68*(2), 29–32. doi:10.4102/sajp.v68i2.13

- Müller, R., Peter, C., Cieza, A., & Geyh, S. (2012). The role of social support and social skills in people with spinal cord injury--a systematic review of the literature. *Spinal Cord*, *50*(2), 94-106. doi:10.1038/sc.2011.116
- Nenova, M., DuHamel, K., Zemon, V., Rini, C., & Redd, W. (2013). Posttraumatic growth, social support, and social constraint in hematopoietic stem cell transplant survivors. *Psycho-Oncology*, *22*(1), 195–202. doi:10.1002/pon.2073
- Norris, F. H., & Kaniasty, K. (1996). Received and perceived social support in times of stress: A test of the social support deterioration deterrence model. *Journal of Personality and Social Psychology*, *71*(3), 498–511.
- Parra, L. A., Bell, T. S., Benibgui, M., Helm, J. L., & Hastings, P. D. (2018). The buffering effect of peer support on the links between family rejection and psychosocial adjustment in LGB emerging adults. *Journal of Social and Personal Relationships*, *35*(6), 854-871.
- Peter, C., Schulenberg, S., Buchanan, E., Prodinger, B., & Geyh, S. (2016). Rasch analysis of measurement instruments capturing psychological personal factors in persons with spinal cord injury. *Journal of Rehabilitation Medicine*, *48*(2), 175–188. doi:10.2340/16501977-2028
- Post, M. W. M., & Van Leeuwen, C. M. C. (2012). Psychosocial issues in spinal cord injury: a review. *Spinal cord*, *50*(5), 382-389.
- Post, M., van Leeuwen, C., van Koppenhagen, C., & de Groot, S. (2012). Validity of the Life Satisfaction Questions, the Life Satisfaction Questionnaire, and the Satisfaction With Life Scale in Persons With Spinal Cord Injury. *Archives of Physical Medicine and Rehabilitation*, *93*(10), 1832–1837. doi:10.1016/j.apmr.2012.03.025

- Pozzar, R., Hammer, M. J., Underhill-Blazey, M., Wright, A. A., Tulsy, J. A., Hong, F., ... & Berry, D. L. (2020). Threats of bots and other bad actors to data quality following research participant recruitment through social media: Cross-sectional questionnaire. *Journal of medical Internet research*, 22(10), 1-10.
- Prevatt, B.-S., Lowder, E. M., & Desmarais, S. L. (2018). Peer-support intervention for postpartum depression: Participant satisfaction and program effectiveness. *Midwifery*, 64, 38–47.
- Radloff, L. S. (1977). CES-D scale: A self report depression scale for research in the general populations. *Applied Psychological Measurement*, 1, 385-401.
- Robinson-Whelen, S., Taylor, H., Feltz, M., & Whelen, M. (2016). Loneliness among people with spinal cord injury: Exploring the psychometric properties of the 3-item loneliness scale. *Archives of Physical Medicine and Rehabilitation*, 97(10), 1728–1734.  
doi:10.1016/j.apmr.2016.04.008
- Rocchi, M., Zelaya, W., & Sweet, S. (2018). Peer mentorship for adults with spinal cord injury: a static group comparison between mentees and non-mentees' reported coping strategies. *Spinal Cord*, 56(11), 1102–1109.
- Sarason, B. R., Sarason, I. G., & Pierce, G. R. (Eds.). (1990). *Social support: An interactional view*. John Wiley & Sons.
- Sarason, B. R., Shearin, E. N., Pierce, G. R., & Sarason, I. G. (1987). Interrelations of social support measures: Theoretical and practical implications. *Journal of Personality and Social Psychology*, 52(4), 813–832.
- Shaw, R. B., Sweet, S. N., McBride, C. B., Adair, W. K., & Martin Ginis, K. A. (2019). Operationalizing the reach, effectiveness, adoption, implementation, maintenance (RE-

- AIM) framework to evaluate the collective impact of autonomous community programs that promote health and well-being. *BMC Public Health*, 19(1).
- Stamatakis, C. (2015). *The efficacy of peer support in stroke rehabilitation* (Doctoral dissertation). Available from ProQuest Dissertations & Theses Global. (UMI No. 10115234)
- Stanley, M., Beck, J., & Zebb, B. (1998). Psychometric properties of the MSPSS in older adults. *Aging & Mental Health*, 2(3), 186–193. doi:10.1080/13607869856669
- Steginga, S., Pinnock, C., Gardner, M., Gardiner, R., & Dunn, J. (2004). Evaluating peer support for prostate cancer: The prostate cancer peer support inventory. *BJU International*, 95(1), 46–50.
- Stice, E., Ragan, J., & Randall, P. (2004). Prospective relations between social support and depression: Differential direction of effects for parent and peer support? *Journal of abnormal psychology*, 113(1), 155.
- Sweet, S., Michalovic, E., Latimer-Cheung, A., Fortier, M., Noreau, L., Zelaya, W., & Martin Ginis, K. (2018). Spinal cord injury peer mentorship: Applying self-determination theory to explain quality of life and participation. *Archives of Physical Medicine and Rehabilitation*, 99(3), 468–476.
- Sweet, S., Noreau, L., Leblond, J., & Martin Ginis, K. (2016) Peer support need fulfillment among adults with spinal cord injury: relationships with participation, life satisfaction and individual characteristics, *Disability and Rehabilitation*, 38(6), 558-565.
- Tait, R., & Silver, R. C. (1989). Coming to terms with major negative life events. In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 351–382). New York: The Guilford Press.

- Thoits, P., Hohmann, A., Harvey, M., & Fletcher, B. (2000). Similar-other support for men undergoing coronary artery bypass surgery. *Health Psychology, 19*(3), 264–273.  
doi:10.1037/0278-6133.19.3.264
- Uchino, B. N. (2009). Understanding the links between social support and physical health: A life-span perspective with emphasis on the separability of perceived and received support. *Perspectives on Psychological Science, 4*(3), 236–255.
- Ussher, J., Kirsten, L., Butow, P., & Sandoval, M. (2006). What do cancer support groups provide which other supportive relationships do not? The experience of peer support groups for people with cancer. *Social science & medicine, 62*(10), 2565-2576.
- Veith, E., Sherman, J., Pellino, T., Yasui, N., & Veith, E. (2006). Qualitative analysis of the peer-mentoring relationship among individuals with spinal cord injury. *Rehabilitation Psychology, 51*(4), 289–298.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*(6), 1063-1070. doi:10.1037/0022-3514.54.6.1063
- Wethington, E., & Kessler, R. C. (1986). Perceived support, received support, and adjustment to stressful life events. *Journal of Health and Social Behavior, 27*(1), 78–89.  
<https://doi.org/10.2307/2136504>
- Wood-Dauphinee, S. L., Opzoomer, M. A., Williams, J. I., Marchand, B., & Spitzer, W. O. (1988). Assessment of global function: The Reintegration to Normal Living Index. *Archives of Physical Medicine and Rehabilitation, 69*, 583–590.
- World Health Organization. (2013, November 19). *Spinal cord injury*. Retrieved September 2, 2020, from <https://www.who.int/news-room/fact-sheets/detail/spinal-cord-injury>

- Wortman, C. B., & Lehman, D. R. (1985). Reactions to victims of life crises: Support attempts that fail. In I. G. Sarason & B. R. Sarason (Eds.), *Social support: Theory, research, and applications* (pp. 463- 489). Dordrecht, The Netherlands: Martinus Nijhoff.
- Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The Multidimensional Scale of Perceived Social Support. *Journal of Personality Assessment*, 52(1), 30-41.
- doi:10.1207/s15327752jpa5201\_2

## Appendix A Demographics

1. What is your gender identity?
  - Female
  - Male
  - Non-binary
2. Where do you live? (Country, city) \_\_\_\_\_
3. What is your age? \_\_\_\_\_
4. What is the highest level of education you have completed?
  - 12<sup>th</sup> grade or less, no diploma
  - High school graduate
  - Some college/university, no degree
  - College diploma
  - Bachelor's degree
  - Master's degree
  - Professional or doctorate degree

I would like to start off by asking you a few questions about your injury.

5. What was the cause of your injury?
  - Car accident
  - Fall
  - Violence
  - Sports-related injury
  - Other [Text box]
6. How long ago did you sustain your injury? \_\_\_\_\_
7. Injury severity – level and classification
  - a. What level of your spine is your injury at?
    - High cervical (C1-C4)
    - Low cervical (C5-C8)
    - Thoracic (T1-T5)
    - Thoracic (T6-T12)
    - Lumbar (L1-L5)
    - Sacral (S1-S5)

b. How was your injury classified?

- Tetraplegic
- Paraplegic
- Ambulatory

8. Who do you live with? (Select all that apply)

- Parents
- Spouse/ Partner
- Children
- Alone
- Other: (text box)

9. In the past month, how hard has it been for you to pay for the very basics like food, housing, medical care, and heating? Would you say... (Source: Institute of Medicine, 2014)

- Very hard
- Hard
- Somewhat hard
- Not very hard

### Multidimensional Scale of Perceived Social Support

Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The Multidimensional Scale of Perceived Social Support. *Journal of Personality Assessment*, 52(1), 30-41. doi: 10.1207/s15327752jpa5201\_

Instructions: I now have a few questions about the support you receive from **your family and friends who do not have a spinal cord injury**. I am interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>Very Strongly Disagree</b>	<b>Strongly Disagree</b>	<b>Mildly Disagree</b>	<b>Neutral</b>	<b>Mildly Agree</b>	<b>Strongly Agree</b>	<b>Very Strongly Agree</b>

1. There is special person (who does not have an SCI) around when you are in need.
2. There is a special person (who does not have an SCI) with whom you can share your joys and sorrows.
3. Your family and/or non-SCI friends really try to help you.
4. You get the emotional help and support you need from your family and/or non-SCI friends.
5. You have a special person (who does not have an SCI) who is a real source of comfort to you.
6. You can count on your family and/or non-SCI friends when things go wrong.
7. You can talk about your problems with your family and/or non-SCI friends.
8. There is a special person (who does not have an SCI) in your life who cares about your feelings.
9. Your family and/or non-SCI friends are willing to help you make decisions.

What challenges (if any) do you have when you bring up your SCI or SCI-related concerns with your family and non-SCI friends? [Text Box]

## Social Constraints Scale

Lepore, S. J., & Ituarte, P. H. G. 1999. Optimism about cancer enhances mood by reducing negative social interactions. *Cancer Researcher Therapeutics Control*, 8,165–74.

**Instructions:** Sometimes other people want to be helpful but for one reason or another, they are not particularly helpful – maybe even unhelpful. I'd like to ask you a few questions about whether you have had any experiences like that. The following statements describe different types of responses that you may receive when you attempt to discuss your concerns with **family and non-SCI friends**. Please indicate **how often you experience each type of response**.

<b>1</b> <b>Never</b>	<b>2</b> <b>Seldom</b>	<b>3</b> <b>Sometimes</b>	<b>4</b> <b>Often</b>
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How often in the last month have your family and friends...

1. Trivialized your problems.
2. Hid their feelings.
3. Did not understand your situation.
4. Did not show concern.
5. Minimized your problems.
6. Complained about their own problems.
7. Avoided you.
8. Acted uncomfortable when you talked about your condition.
9. Felt uncomfortable and made you keep feelings to yourself.
10. Felt upset and made you keep feelings to yourself.
11. Did not want to hear about your condition.
12. Changed the subject.
13. Told you to try not to think about your condition.
14. Told you not to worry so much about your health.
15. Acted cheerful around you.
16. Told you they know how you feel.\* (Wortman & Lehman, 1985)
17. Did things for you that you wanted to do and could have done yourself.\* (USII; Ingram et al., 2001)

Starred items added by the author.

## Peer Support

Now I'd like to talk to you about **peer** support. By peer support I mean **the support you receive from others living with SCI**. This can include a formal mentorship program with a trained peer mentor, but it can also include informal relationships you developed with others in the rehabilitation facility, or online for example.

1. How many peers are you in regular contact with? \_\_\_\_\_
2. How often are you in contact with these people?
  - More than once a week
  - About once a week
  - About two or three times a month
  - Once a month or so
  - About two or three times a year
  - Once a year
  - Never
3. Has the COVID-19 pandemic changed *how frequently* you interact with your peers?
  - Yes. I interact with my peers more frequently now.
  - Yes. I interact with my peers less frequently now.
  - No. The pandemic has not changed how frequently I interact with my peers.
4. When you meet with your peer(s), is it one-on-one or in a group format?
  - One-on-one
  - Group
  - Both one-on-one and in groups
5. Before the COVID-19 pandemic, how did you meet with your peers? (Select all that apply)
  - In-person
  - Virtually, online
  - Telephone
6. Has the COVID-19 pandemic changed *how* you interact with your peers?
  - Yes --- branch to #9
  - No
7. If yes, how so? [Text box]

8. Have your peer supporters received training?
- Yes
  - No
  - Some
  - I do not know
9. How satisfied are you with the support you receive from your peers?
- Very satisfied
  - Satisfied
  - Neutral
  - Dissatisfied
  - Very dissatisfied
10. Can you tell me a little about what is satisfying/dissatisfying about the peer support you receive?
11. Having people in my condition available to connect with is important to me.
- Strongly agree
  - Agree
  - Neither agree nor disagree
  - Disagree
  - Strongly disagree
12. Has the COVID-19 pandemic changed *how much you value* the peer support you receive?
- Yes --- branch to #14
  - No
13. If yes, how so? [Text box]
14. What aspect of your peer relationship(s) is most valuable to you? [Text Box]
15. Are there any aspects of your peer relationships that are not valuable or have had a negative impact on you? If so, please describe. [Text Box]
16. If there is anything else you would like to add about how the support from other people living with spinal cord injuries impacts your life, please type it in the text box below. [Text Box]

## Spinal Cord Injury Peer Support Inventory

Adapted from:

Steginga, S., Pinnock, C., Gardner, M., Gardiner, R., & Dunn, J. (2005). Evaluating peer support for prostate cancer: The prostate cancer peer support inventory. *BJU International*, 95(1), 46–50.

**Instructions:** Please rate the following statements regarding your interactions **with other people living with spinal cord injury (i.e., your peers)**. For each of the following, please rate the extent to which you agree with each statement, using the scale from 1 to 7 as shown below. *Please respond as you really feel*, rather than how you think “most people” feel.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Slightly Disagree</b>	<b>Neither Agree Nor Disagree</b>	<b>Slightly Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>

1. Your SCI peers share their personal experience with spinal cord injury. [P]
2. You feel that you understand your spinal cord injury better because of your relationships with your SCI peers. [P]
3. Your SCI peers are an inspiration to you. [I]
4. You receive helpful information about spinal cord injury management from your SCI peers. [P]
5. You know that someone in your condition is always available when you need someone to talk to. [E]
6. You feel a sense of connection with your SCI peers. [E]
7. You feel reassured by your SCI peers about how to direct your care. [P]
8. You feel more in control of your life because of the support you receive from your SCI peers. [I]
9. You can talk about your SCI-related concerns with your SCI peers. [E]
10. Your SCI peers have helped you realize that your life – even though it may be different – can be meaningful. [I]
11. You can discuss worrying thoughts and emotions with your SCI peers. [E]
12. You feel reassured about your personhood by your SCI peers. [I]
13. You receive practical information from your SCI peers about secondary health conditions. [P]
14. You receive support from your SCI peers about coping with your losses. [E]
15. Your SCI peers have helped you regain a sense of purpose in your life. [I]

P: practical support item

E: emotional support item

I: identity-changing influence item

**Instructions:** Now I'd like to ask you some questions about how your life is going these days.

**Center for Epidemiologic Studies Depression Scale Revised (CESD-R10)**

<b>Rarely or none of the time (less than 1 day)</b>	<b>Some or a little of the time (1-2 days)</b>	<b>Occasionally or a moderate amount of time (3-4 days)</b>	<b>All of the time (5-7 days)</b>
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1. I was bothered by things that usually don't bother me.
2. I had trouble keeping my mind on what I was doing.
3. I felt depressed.
4. I felt that everything I did was an effort.
5. I felt hopeful about the future.
6. I felt fearful.
7. I felt I was just as good as other people.
8. I was happy.
9. I felt sad.
10. I could not "get going."

## Positive and Negative Affect Schedule

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54(6), 1063-1070. doi:10.1037/0022-3514.54.6.1063

**Instructions:** This scale consists of a number of words that describe different feelings and emotions. Read each item and then select the number for the scale next to each word. Indicate to what extent you have felt this way **in the past few weeks**.

1	2	3	4	5
Not at all	A little	Sometimes	Quite often	Very often

1. Interested
2. Distressed
3. Excited
4. Upset
5. Guilty
6. Scared
7. Hostile
8. Enthusiastic
9. Proud
10. Irritable
11. Alert
12. Ashamed
13. Inspired
14. Nervous
15. Determined
16. Attentive
17. Jittery
18. Active
19. Afraid

[Four items to be added to measure]

20. Calm
21. Frustrated
22. Annoyed
23. Confident

### Satisfaction with Life Scale

Diener, E., Emmons, R., Larsen, R., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment*, 49(1), 71–75. doi:10.1207/s15327752jpa4901\_13

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Slightly Disagree</b>	<b>Neither Agree Nor Disagree</b>	<b>Slightly Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>

**Instructions:** Below are five statements that you may agree or disagree with. Using the 1 - 7 scale below, indicate your agreement with each item. Please be open and honest in your responding.

1. In most ways my life is close to my ideal.
2. The conditions of my life are excellent.
3. I am satisfied with my life.
4. So far, I have gotten the important things I want in life.
5. If I could live my life over, I would change almost nothing.

### 3-Item Loneliness Scale

Hughes, M., Waite, L., Hawkley, L., & Cacioppo, J. (2004). A short scale for measuring loneliness in large surveys: Results from two population-based studies. *Research on Aging, 26*(6), 655–672. doi:10.1177/0164027504268574

**Instructions:** Below are three statements that you may agree or disagree with. Using the 1 - 5 scale below, indicate your agreement with each item. Please be open and honest in your responding.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Never</b>	<b>Sometimes</b>	<b>About half the time</b>	<b>Most of the time</b>	<b>Always</b>

1. How often do you feel you lack companionship?
2. How often do you feel left out?
3. How often do you feel isolated from others?

## Reintegration to Normal Living (RNL) Index

Wood-Dauphinee, S. L., Opzoomer, M. A., Williams, J. I., Marchand, B., & Spitzer, W. O. (1988). Assessment of global function: The Reintegration to Normal Living Index. *Archives of Physical Medicine and Rehabilitation*, 69, 583–590.

**Instructions:** Below are eleven statements that you may agree or disagree with. Using the 0-2 scale below, indicate your agreement with each item. Please be open and honest in your responding.

<b>0</b>	<b>1</b>	<b>2</b>
<b>Does not describe my situation</b>	<b>Partially describes my situation</b>	<b>Fully describes my situation</b>

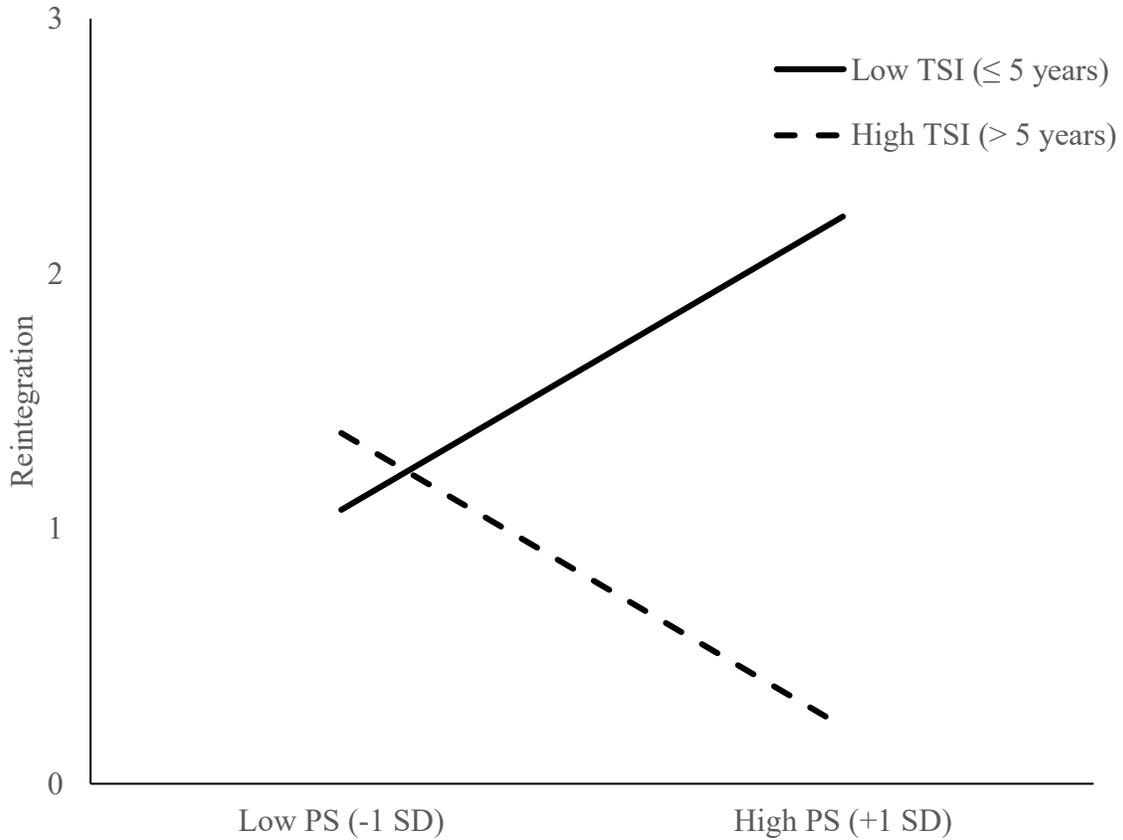
1. I move around my living quarters as I feel necessary.
2. I move around my community as I feel necessary.
3. I am able to take trips out of town as I feel are necessary.
4. I am comfortable with how my self-care needs are met.
5. I spend most of my days occupied in a work activity that is necessary or important to me.
6. I am able to participate in recreational activities as I want to.
7. I participate in social activities with family, friends, and/or business acquaintances as is necessary or desirable to me.
8. I assume a role in my family that meets my needs and those of other family members.
9. In general, I am comfortable with my personal relationships.
10. In general, I am comfortable with myself when I am in the company of others.
11. I feel that I can deal with life events as they happen.

Was this survey completed with assistance?

- Yes  
 No

## Appendix B

### The Moderating Role of Time Since Injury (TSI) on the Relation Between Peer Support and Reintegration



*Note.* This figure demonstrates the extent to which peer support was associated with reintegration as a function of time since injury (TSI). The association between peer support and reintegration was positive (although not significant) when TSI was low ( $\leq 5$  years) and zero when TSI was high ( $> 5$  years).