Randomised controlled trial of ePACT: a flexible treatment for depression and anxiety in adults living chronic spinal cord injury

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Main Messages

• Standardised screening for mood disturbance in adults with chronic spinal cord injury (SCI) should be a part of all health reviews irrespective of time since injury or previously demonstrated resilience because of the high prevalence of mental health problems such as anxiety and depression.
• Mood disturbance often go undetected and further impairs quality of life yet is open to treatment.
• Electronically delivered psychological therapy, supplemented with clinical support (by phone, email or in person) is a convenient, effective and cost efficient approach that will benefit many, especially those living in rural, regional and outer metropolitan areas or who have difficulty accessing help.
• The benefit of mental health clinician support to supplement electronically delivered psychological therapy should not be underestimated.
• While medical care is essential, face to face contact necessitated by appointments and tests imposes a heavy demand of time and effort on the resources of adults living with SCI.
• The opportunity to work on improving well being in the convenience of the home environment, is appreciated by individuals with a SCI.
Executive summary

The issues

Individuals with a SCI are highly vulnerable to suffer from mental health problems and stress mainly in the form of anxiety and depression which further compromises their quality of life and adversely affects their relationships and community participation.

The majority of these mental health problems go unrecognised by clinical services, the person themself and their family.

Social withdrawal consequent on these mental health problems exacerbated by access, mobility, travel difficulties and demands of daily living make it difficult to easily attend clinics for help with these difficulties.

Effective methods for screening for anxiety and depression in individuals with SCI that can be used in clinics or even by the person themself are likely to improve the identification of these problems as a first step towards effective treatment.

The availability of novel forms of treatment and mental health promotion that are accessible, acceptable and sympathetic to the special needs of this group are needed.

A solution

This team has developed an easy method of screening for mental health problems in adults with a SCI and also an evidence-based on-line treatment and mental health promotion program (ePACT) which individuals with a SCI can engage with in the comfort and convenience of their own home. The person can choose which elements of the program suits their own needs and if they wish to receive on-line or telephone support from a counsellor.

The aim of this project was to make ePACT available to people with a SCI who had unrecognised mental health problems and determine if it was an effective and acceptable form of help.

What was done

Individuals with a SCI who were in contact with their specialist SCI clinic were invited to complete the specially designed mental health screening checklist. Individuals identified with some mental health problems which were adversely affecting their life were invited to participate in the on-line ePACT program. Some were allocated to a waiting list which provided the opportunity to demonstrate program effectiveness in comparison to those who immediately received the treatment. Mental health and quality of life improvements and program acceptability were evidence of program effectiveness.

The development of this accessible therapy came about because of a survey of adults with a SCI conducted ten years ago, which revealed that many of these adults recounted how they had never seen a mental health professional to assist with their adjustment to living with SCI. This was of great concern since roughly half of these adults were also experiencing considerable levels of mood disturbance. There are several reasons why this might have been so. It is possible some could have seen a psychiatrist or psychologist whilst in hospital and/or rehabilitation but simply did not remember the contact. Many of these adults worked very hard in rehabilitation so they could return to independent living. Needing to consult a mental health professional could feel like such a backward step and too difficult to contemplate. Still for others, mobility/accessibility issues, and stigma prevented them from connecting with mental health services.
Nevertheless, with the advances in technology and electronic networking it is now possible to access mental health services within the comfort and privacy of home. To this end, a flexible electronically delivered intervention was developed specifically to help adults living with SCI and co-morbid depression and/or anxiety. The intervention was designed to encourage self-help yet provide an evidence based treatment that the person could tailor to their own needs. If necessary the internet treatment was supported by a mental health clinician by telephone or email as needed.

The flexible treatment for depression and anxiety (e-PACT) was based on well-established cognitive behavioural principles together with elements of positive psychology and mindfulness meditation. ePACT consists of 10 modules designed to be implemented over a 10-12 week period. It has some between-module activities and is complemented with as little or as much clinician support as the client wishes. At the beginning of this project, in order to test feasibility of the project design, ePACT was provided to three adults living with long-term spinal cord injury and co-morbid mood disturbance.

At the end of this ePACT trial, the levels of mood disturbance experienced by each adult had improved substantially as did their satisfaction with life as a whole. Each person found the intervention to be both accessible and acceptable. Furthermore, each person recounted how they would not have sought help from a mental health professional because of issues connected with stigma, shame and concern for the potential reduction to their independence. Interestingly, two of the three adults did not do every module but chose those which they thought were relevant to their own particular needs.

The next step after this successful test was to offer the intervention to the community of adults with a SCI and explore its efficacy and acceptability in a randomised controlled trial of ePACT. This involved the random (by chance) allocation of adults with chronic SCI and associated anxiety or depression to either immediate participation in ePACT (immediate start group) or to a group who waited for 10 weeks before having the opportunity to do ePACT (wait-list control group).

Results

Electronically delivered psychological therapy to treat associated anxiety and mood disturbance suffered by many adults living with a spinal cord injury (SCI) is convenient, effective and cost efficient. The evidence based therapy developed specifically for adults with a SCI is named ePACT: electronic personal administration of cognitive therapy.

The therapy was convenient for the adults with SCI as treatment because (1) It was done in the comfort of their own home at a time that suited them; (2) They did not have to arrange transport which was especially important if they resided in a rural, regional or even outer metropolitan area; (3) They did not have to struggle with wheelchair accessibility which was reported to be an ever present issue even at some professional rooms; and (4) It could be done at a flexible time that avoided the need to find an appointment time that fitted into an already busy week taken up with medical appointments, and other often demanding self care and other obligations of everyday living. Some of the adults with a SCI also reflected that it encouraged their autonomy. The treatment was convenient for clinicians because their provision of support was largely delivered on an as-needed basis rather than the regular and more substantial blocks of workday time necessitated by face-to-face appointments.

Effectiveness was evident in the significant drop in symptoms connected with anxiety and mood disturbance reported by the adults who participated in the therapy compared to the adults who were on the waitlist. What is more, the participants found that they did not need to complete every module and activity of ePACT to experience the benefits but could choose those elements of the program that met their own specific needs; a similar finding to the earlier trial of the effectiveness of ePACT.
Cost efficiency for clinicians can be extrapolated by the reduction in time needed by clinicians to conduct face-to-face treatment as well as leading to an increase in the number of patients with SCI that can be effectively treated for associated anxiety and mood disturbance. Acceptability and convenience of an on-line treatment also promotes treatment reach into the community. Cost efficiency for clients can also be extrapolated as they skip the need to arrange appropriate transport to keep appointments and are able to revisit online, various aspects of therapy whenever they want without the need to make another appointment. These self-directed “booster” sessions are known to reinforce treatment effectiveness and encourage better long-term outcomes and promote mental health. These aspects can be especially important if community access is a problem or if the person is more isolated in rural, regional or outer metropolitan areas.

Of course, not everyone benefitted by doing the ePACT program. There were several people who dropped out – each within the first week or two of starting. Different reasons were given including underestimating their computer skills, having old equipment that broke down and no funds for replacements or readmission to hospital. Some struggled to find the time in their lives already filled with medical appointments and self-care timetables, some found they were unwilling/not ready for the time commitment, and some were simply living in chaos. There were also several people who opted for face-to-face therapy rather than taking part in the trial. These people were given a referral to their GP who could connect them with a suitable local mental health clinician.
Context

Around ten years ago, many adults on the spinal cord injury (SCI) register living in the Victorian community participated in a research project that looked at their quality of life and mental health - *Mapping Wellbeing after Spinal Cord Injury* 7. At that time, many participants demonstrated great resiliency but there were also many individuals experiencing significant mental health issues such as depression ². Psychological co-morbidity with depression, for example anxiety, was also found to be substantially higher than the general population. In addition, the majority of those with depression were not receiving any specific treatment or psychological support. This was likely due, at least in some part, to accessibility, stigma and a reluctance to seek help as this might be seen as a sign of weakness or work against their understandable desire for independence.3,7 That project confirmed a significant unmet need for the provision of psychological help and also suggested a need for a more relevant method of delivery than the typical face-to-face appointments.

There is evidence that mental health literacy and psychological treatments for problems such as anxiety and depression can be effectively and conveniently provided online in the comfort of a person’s own home.8,9 A small *beyondblue*-funded pilot study ¹⁰ was undertaken to address that gap and led to the successful development and pilot study of a flexible psychological treatment for depression and/or anxiety in this population (e-PACT). An electronic delivery was used because the treatment needed to be accessible and acceptable to individuals with a SCI in order to encourage them to seek and utilise help.

The ePACT program was designed specifically for individuals with SCI who were living with the co-morbidity of an emotional disorder. ePACT is a manualised 10 module program that is delivered online, supplemented, if necessary with some personal contact and support by an experienced mental health clinician. The pilot study provided in principle evidence of the concept and feasibility of ePACT. Interestingly, each adult who participated in that small pilot study told the research team that they would not have actively sought out help because of issues to do with the perceived stigma connected with mental health issues, and a strong need to maintain their independence. That small pilot study confirmed that the electronic delivery of psychological treatment was both possible and acceptable.

The overall aim of the current project was to extend that earlier study of ePACT and determine if it is suitable and effective in the general community. Specifically the research questions were:

- Will the electronic delivery of psychological help be acceptable to the broad community of adults with SCI and co-morbid emotional disorder?
- Will those who do the ePACT program experience relief from their symptoms of anxiety and depression?
- Will their subjective quality of life also improve?

Implications

Standardised screening for mood disturbance in adults with chronic SCI should be a part of all health reviews irrespective of time since injury or previously demonstrated resilience

Electronically delivered psychological therapy, supplemented with clinical support (by phone, email or in person) is a convenient, effective and cost efficient approach that will benefit many, especially those living in rural, regional and outer metropolitan areas

The benefit of mental health clinician support to supplement electronically delivered psychological therapy when requested was valued and should not be underestimated
While medical care is essential many individuals with a SCI struggle with the cumulative demands and time and effort required by all the ongoing appointments and tests and therefore greatly appreciate the opportunity to receive online mental health support in the comfort and convenience of their own home at times that suit them.

**Approach**

In principle support of the accessibility and acceptability of the psychological intervention - ePACT - was established in the small pilot study. This current project aimed to establish the efficacy of ePACT using a randomised waitlist-control trial. Ethics approval was gained from all the relevant human ethics committees: Alfred Health Human Ethics Committee, Austin Health Human Ethics Committee; and Monash University Human Ethics Committee. Adult patients who attended outpatient clinics of the two specialist spinal cord injury rehabilitation units were screened using the validated Depression, Anxiety and Stress Scale – Short Form (DASS21). Those adults who scored outside the normative range of the DASS21 were deemed to be experiencing clinically significant symptoms of mood disturbance that would benefit from psychological support and so were provided with several possibilities of accessing psychological support that included being part of the ePACT the study.

Adults who accepted the invitation completed an intake interview that involved the collection of some demographic information and two further standardised scales: the Personal Wellbeing Index (PWI) and the Spinal Cord Lesion Emotional Wellbeing Questionnaire Version 1 Australia (SCL EWQ v1 Aus). On completion of the intake interview, individuals were randomised to either Group A (the intervention group) or Group B (the waitlist control group). Group allocation was based on the next available slot in a sequence list that was prepared using a computer-generated block randomisation method. Group A participants were then given some verbal instructions and sent a link to the online program while the need to wait before active participation was again repeated to Group B participants.

The three standardised scales used in the screening and intake interview (DASS21, PWI, SCL EWQ v1 Aus) were given again to all participants 10-12 weeks after their enrolment into the study. For Group A Immediate start participants, this marked their post-intervention time point so their follow-up interview also included a qualitative component. For Group B Waitlist Control participants, this marked the end of their waiting and after this interview they were then given the link to the online program. Where time allowed, Group A participants were also interviewed six months post-intervention.

**Measures**

All measures were taken at enrolment, at 10-12 weeks post-enrolment, and for a small subset also six months post-intervention. All measures have previously demonstrated satisfactory reliability and validity.

The Depression, Anxiety and Stress Scale short version (DASS-21) is a self-report measure of depression, anxiety and stress in general population groups, clinical population groups and population groups with physical disabilities. Respondents are asked how much each of the 21 items has applied to them over the previous week. The rating scale ranges from 0=did not apply to me at all; 1=applied to me to some degree, or some of the time; 2=applied to me to a considerable degree, or a good part of the time; 3=applied to me very much, or most of the time. Scores of the subscales are summed and then doubled to convert to full DASS scores. Severity ratings comprise normal, mild, moderate, severe and extremely severe.
The Personal Wellbeing Index – Adult (PWI)\textsuperscript{12} is a self-report questionnaire measuring satisfaction with eight quality of life domains: standard of living, health, achieving in life, relationships, safety, community connectedness, future security, and spirituality/religion. A 0-10 rating scale is used where 0 represents completely dissatisfied, 10 represents complete satisfied and 5 is neutral. Overall satisfaction with life is the mean average of the eight domain scores.

The Spinal Cord Lesion Emotional Wellbeing Questionnaire version 1 Australia (SCL EWL v1 Australia)\textsuperscript{13} is a 12 item self-report measure that assesses 3 domains of wellbeing (helplessness, intrusion, personal growth) in individuals with SCI at that particular time. This study will be focusing on Helplessness only since that was found to have a strong connection with both positive (higher satisfaction with life) and negative (higher levels of mood disturbance) than other independent variables in the earlier Mapping Wellbeing study. The domain Helplessness reflects perplexity, lack of control and loss of self-esteem. Respondents select from 1=strongly disagree, 2=disagree, 3=agree or 4=strongly agree. The score for each domain is the overall mean of the items within each domain and can range from one to four. Higher scores represent higher affirmation of the domain.

**Participants**

Patients who attended dedicated SCI outpatient clinic at the Caulfield Hospital were screened over a 15-month time period. In addition, patients who were registered on the Austin/Royal Talbot Hospital outpatient list were approached over a similar 15-month time period were screened. Eligibility criteria were being adult (18yrs of age) with chronic SCI and comorbid mood disturbance (outside DASS21 normative range), and being computer literate. In total, 573 adults with chronic SCI were screened with 263 adults (46%) scoring above the normative DASS21 threshold. Seventy-one adults signed the consent form to take part in the program representing a 27% response rate. Twelve adults (17%) failed to complete the intake process leaving a final sample size of 59 adults with chronic SCI and co-morbid mood disturbance entering into the ePACT program. Eleven adults dropped out in the interim leaving 48 adults at Time 2. Furthermore, 12 adults assigned to Group A were interviewed at Time 3 (6 months post-intervention).

See Figure 1 for project pathway
573 adults with chronic SCI screened for mood disturbance

263 adults met criteria (scored above normative DASS21 threshold)

71 adults signed consent to take part in program

12 failed to complete program intake

59 adults randomly assigned to

Group A Immediate start

Dropped out $n=11$
(completed 1-2 modules max)

Completed T2 questionnaires/interview ($n=23$)

Eligible for T2 analyses ($n=48$)

Group B Waitlist control ($n=25$)

Dropped out $n=0$

Completed T2 questionnaires ($n=25$)

Figure 1 ePACT project pathway diagram
Analyses

Comparative analyses were used to assess potential differences between groups as follows

1) Those who completed the intake process and those who did not (independent-samples t-tests)
2) Those who stayed within the study and those who dropped out (independent-samples t-tests)
3) Those who were allocated to Group A with those who were allocated to Group B – between groups at Time 1 (independent-samples t-tests)
4) Change of outcomes for Group A Immediate start participants with the outcomes of Group B Waitlist control participants over time (paired samples t-tests; general linear regressions)
5) The small subgroup that were measured across all three time points (one-way repeated measures ANOVA, post hoc analyses - pairwise comparison where appropriate)

Thematic analyses is currently being conducted on the qualitative responses to questions asked at different stages of the study exploring a variety of topics such as the impact of the ePACT program and why people dropped out of the program.

Additional post hoc analyses were used to explore differences between the results of the screening in the current study with the results of the previous large-scale population-based study of approximately nine years ago.

Please note: The results being provided in this report represent the first level of analyses for the project. Further more sophisticated quantitative and qualitative analyses are currently being conducted and will be provided when available.

Results

Screening

Those who scored within normative range in all DASS21 subscales indicating the absence of mood disturbance (n=310, 54%) so did not meet criteria for study. Just over half who did meet criteria were willing to receive psychological support (n=135, 51.3%), 25% of whom were already seeing a mental health professional. Table 1 provides a screening breakdown and pathways of those who scored above one or more of the normative DASS21 Depression, Anxiety and Stress thresholds so indicating a high level of mood disturbance and likely presence of psychopathology (descriptive frequencies)
Table 1 What happened next to those who met criteria, i.e., those identified with mood disturbance (N=263)

<table>
<thead>
<tr>
<th>What happened next</th>
<th>Count (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unknown</td>
<td>28 (10.6%)</td>
</tr>
<tr>
<td>No computer/skills</td>
<td>11 (4.2%)</td>
</tr>
<tr>
<td>Already seeing a mental health professional and/or maintained close contact with their GP</td>
<td>35 (13.3%)</td>
</tr>
<tr>
<td>No problems</td>
<td>50 (19%)</td>
</tr>
<tr>
<td>ESL</td>
<td>2 (.8%)</td>
</tr>
<tr>
<td>Not contactable so sent letter</td>
<td>27 (10.3%)</td>
</tr>
<tr>
<td>Declined</td>
<td>10 (3.8%)</td>
</tr>
<tr>
<td>Accepted referral for face to face</td>
<td>29 (11%)</td>
</tr>
<tr>
<td>Agreed to but failed to complete intake process *</td>
<td>12 (4.6%)</td>
</tr>
<tr>
<td>ePACT</td>
<td>59 (22.4%)</td>
</tr>
<tr>
<td>Total N</td>
<td>263 (100%)</td>
</tr>
</tbody>
</table>

Table 2 displays additional post hoc analysis used to explore differences between the results of the screening in the current study with the results of the previous large-scale population-based study Mapping Wellbeing after SCI\textsuperscript{2} of approximately ten years ago.

Table 2 Contingency table displaying numbers within the current ePACT study and the previous Mapping Wellbeing study partitioned by the presence of mood disturbance

<table>
<thead>
<tr>
<th></th>
<th>Within normative range ^</th>
<th>Above normative threshold +</th>
<th>Total sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous Mapping Wellbeing study\textsuperscript{1} 2004-5</td>
<td>$n=222$</td>
<td>$n=209$</td>
<td>$N=431$</td>
</tr>
<tr>
<td>Screening in current ePACT study 2012-3</td>
<td>$n=310$</td>
<td>$n=263$</td>
<td>$N=573$</td>
</tr>
</tbody>
</table>

^ Scored within the normative range in each of the DASS21 Depression, Anxiety & Stress subscales indicating the absence of psychopathology  
+ Scored above the normative threshold in at least one DASS21 subscale indicating a high level of symptoms of mood disturbance and likely presence of psychopathology

Chi-square test for independence was not significant [$\chi^2 = 0.66$, $df(1) p=.42$]. This suggests that over the previous 10 years or so, support services’ business as usual provided to community dwelling adults with SCI has not made enough of a difference to the rates of psychopathology manifest as depression, anxiety and/or clinical level of stress which remain substantially higher than the general population. This reinforces the need for multiple methods of delivery of psychological support.
Responses to the research questions

1) Those who completed the intake process and those who did not

An independent-samples t-test was conducted to compare the Depression, Anxiety and Stress scores in individuals who completed the intake process and individuals who failed to complete the intake process.

Individuals who failed to complete the intake process did not differ from those who completed the Time 1 intake process.

Table 3 t-tests comparing those who completed the intake process and those who did not

<table>
<thead>
<tr>
<th></th>
<th>Intake process completed (n=59)</th>
<th>Intake process not completed (n=12)</th>
<th>Comparative analyses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression M (SD)</td>
<td>19.42 (10.65)</td>
<td>22.83 (11.33)</td>
<td>t=-1.00 (df,69), p=.32</td>
</tr>
<tr>
<td>Anxiety M (SD)</td>
<td>11.15 (8.68)</td>
<td>14.17 (9.70)</td>
<td>t=-1.08 (df,69), p=.29</td>
</tr>
<tr>
<td>Stress M (SD)</td>
<td>17.08 (9.16)</td>
<td>22.83 (8.68)</td>
<td>t=-2.00 (df,69), p=.05</td>
</tr>
</tbody>
</table>

2) Those who stayed within the study and those who dropped out

An independent-samples t-test was conducted to compare the DASS21 (Depression, Anxiety and Stress) scores, PWI (Overall satisfaction with life) scores, and the SCL ECQ v1 Aus (Helplessness) scores in individuals who were still in the ePACT program at Time 2 compared with individuals who dropped out of the ePACT program.

There were no significant differences in Depression, Anxiety & Stress, Satisfaction with Life, or Helplessness, in individuals who stayed with the program and those who dropped out.

Table 4 t-tests comparing those who stayed with the program and those who dropped out

<table>
<thead>
<tr>
<th></th>
<th>Stayed in program (n=48)</th>
<th>Dropped out of program (n=11)</th>
<th>Comparative analyses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression M (SD)</td>
<td>18.79 (10.67)</td>
<td>22.18 (10.60)</td>
<td>t=-.95 (df,57), p=.35</td>
</tr>
<tr>
<td>Anxiety M (SD)</td>
<td>10.92 (8.24)</td>
<td>12.18 (10.79)</td>
<td>t=-.43 (df,57), p=.67</td>
</tr>
<tr>
<td>Stress M (SD)</td>
<td>16.67 (8.88)</td>
<td>18.91 (10.56)</td>
<td>t=-.73 (df,57), p=.47</td>
</tr>
<tr>
<td>Helplessness M (SD)</td>
<td>2.50 (.54)</td>
<td>2.61 (.66)</td>
<td>t=.52 (df,57), p=.59</td>
</tr>
<tr>
<td>Satisfaction with Life M (SD)</td>
<td>5.35 (1.73)</td>
<td>5.33 (1.94)</td>
<td>t=.03 (df,57), p=.97</td>
</tr>
</tbody>
</table>
3) Those who were allocated to Group A with those who were allocated to Group B – between groups at Time 1

An independent-samples t-test was conducted to compare the DASS21 (Depression, Anxiety and Stress) scores, PWI (Overall satisfaction with life) scores, and the SCL ECQ v1 Aus (Helplessness) scores in individuals who were randomly allocated to Group A Immediate start group and Group B Waitlist control group at Time 1. There were no significant differences in the DASS21, PWI and SCL EWQ v1 Aus Helplessness scores according to group membership.

Table 5 t-tests comparing Group A and Group B baseline scores

<table>
<thead>
<tr>
<th></th>
<th>Randomly allocated to Group A Immediate start (n=34)</th>
<th>Randomly allocated to Group B Waitlist control (n=25)</th>
<th>Comparative analyses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression M (SD)</td>
<td>19.65 (10.68)</td>
<td>19.12 (10.81)</td>
<td>t=.19 (df,57), p=.85</td>
</tr>
<tr>
<td>Anxiety M (SD)</td>
<td>12.71 (8.68)</td>
<td>9.04 (8.39)</td>
<td>t=-1.63 (df,57), p=.11</td>
</tr>
<tr>
<td>Stress M (SD)</td>
<td>18.76 (9.15)</td>
<td>14.80 (8.85)</td>
<td>t=1.67 (df,57), p=.10</td>
</tr>
<tr>
<td>Helplessness M (SD)</td>
<td>2.56 (.63)</td>
<td>2.47 (.47)</td>
<td>t=-.57 (df,57), p=.57</td>
</tr>
<tr>
<td>Satisfaction with Life M (SD)</td>
<td>5.01 (1.74)</td>
<td>5.70 (1.74)</td>
<td>t=-1.32 (df,57), p=.19</td>
</tr>
</tbody>
</table>

4) Change of outcomes for Group A Immediate start participants with the outcomes of Group B Waitlist control participants over time

Paired-samples t-test was conducted to consider the impact of the intervention for Group A Immediate Start participants.

Paired-samples t-test was conducted to consider the impact that the equivalent time as the intervention, has made to Group B Waitlist Control participants.

Symptoms of depression significantly decreased over time for participants of both groups though the decrease appears to be greater in the intervention group. The decrease in symptoms in Group B participants may have been because they knew they would get the intervention after their wait so provided them with hope.

Symptoms of Anxiety and Stress decreased significantly for the intervention group only.

Satisfaction with life improved significantly for the intervention group only.

Interestingly, verbal reports suggested that few participants completed all 10 modules of the ePACT program though they did do more than half. Some of the reasons given were difficulties with their computers/internet connections, time constraints often connected with medical problems, and most felt that some of the modules didn’t apply to them and chose those which they thought would be specifically helpful to them.
Table 6 Examining change across time in Group A Immediate start participants

|                       | Group A ePACT participants at Time 1 (n=23) | Group A ePACT participants at Time 2 (n=23) | Comparative analyses | ES ^  
|-----------------------|---------------------------------------------|---------------------------------------------|----------------------|-----  
| Depression M (SD)     | 18.43 (10.74)                               | 12.26 (12.22)                               | t = -2.86 (df,22), p = .009 | .37  
| Anxiety M (SD)        | 12.96 (7.43)                                | 7.57 (7.91)                                 | t = -4.06 (df,22), p = .001 | .43  
| Stress M (SD)         | 18.70 (8.65)                                | 13.13 (9.72)                                | t = -2.94 (df,22), p = .008 | .28  
| Helplessness M (SD)   | 2.53 (.62)                                  | 2.46 (.60)                                  | t = -0.85 (df,22), p = .41 | .24  
| Satisfaction with Life M (SD) | 4.98 (1.67)                               | 5.58 (1.70)                                | t = 2.60 (df,22), p = .02  | .24  

^ ES – Effect size using Eta squared  (≥ .14 = large effect size)

Table 7 Examining change across time in Group B Waitlist control participants

|                       | Group B Waitlist controls at Time 1 (n=25) | Group B Waitlist controls at Time 2 (n=25) | Comparative analyses | ES ^  
|-----------------------|---------------------------------------------|---------------------------------------------|----------------------|-----  
| Depression M (SD)     | 19.12 (10.82)                               | 15.04 (10.81)                               | t = 2.86 (df,24), p = .01 | .25  
| Anxiety M (SD)        | 9.04 (8.39)                                 | 7.24 (8.19)                                 | t = 1.60(df,24), p = .12 | .43  
| Stress M (SD)         | 14.80 (8.85)                                | 13.36 (8.34)                                | t = 1.01 (df,24), p = .32 | .24  
| Helplessness M (SD)   | 2.47 (.47)                                  | 2.58 (.58)                                  | t = -1.12 (df,24), p = .27 | .24  
| Satisfaction with Life M (SD) | 5.70 (1.74)                               | 5.25 (2.07)                                | t = 1.56 (df,24), p = .13 | .24  

^ ES – Effect size using Eta squared  (≥ .14 = large effect size)

5) The small subgroup that were measured across all three time points

The time allowed for the project precluded the longer-term follow-up of all the participants but it is hoped that this will still be done, if possible.

To date, the third interview of six months post-intervention has been conducted with 12 participants. Due to this small sample size and the non-normal distribution of scores (particularly common in social sciences), non-parametric tests were conducted.

Investigation of the small subgroup of Group A Immediate start participants who were eligible for the Time 3 (6mths post-intervention) interview found that, on the whole, DASS21 subscale Depression, Anxiety and Stress scores decreased substantially by the Time 2 post-intervention time point. This not only was maintained for
six months but there was also a further small decrease. This was not found in the satisfaction with life scores that suggest that even though mental health improved, it is likely that they were still living challenging lives.

**Symptoms of Depression**

The results of the Friedman Test indicated that there was a statistically significant difference in DASS21 Depression subscale scores across the three time points (pre-intervention, post-intervention, 6-mth follow-up, $\chi^2(2, n = 12) = 9.73, p = .008$). Inspection of the median values showed a decrease in depression from pre-intervention (Md = 21.00) to post-intervention (Md = 9.00) and a further decrease at follow-up (Md = 7.00).

**Symptoms of Anxiety**

The results of the Friedman Test indicated that there was a statistically significant difference in DASS21 Anxiety subscale scores across the three time points (pre-intervention, post-intervention, 6-mth follow-up, $\chi^2(2, n = 12) = 10.05, p = .007$). Inspection of the median values showed a decrease in depression from pre-intervention (Md = 11.00) to post-intervention (Md = 5.00) and a further decrease at follow-up (Md = 4.00).

**Symptoms of Stress**

The results of the Friedman Test indicated that there was a statistically significant difference in DASS21 Stress subscale scores across the three time points (pre-intervention, post-intervention, 6-mth follow-up, $\chi^2(2, n = 12) = 6.43, p = .04$). Inspection of the median values showed a decrease in depression from pre-intervention (Md = 20.00) to post-intervention (Md = 10.00) and a further decrease at follow-up (Md = 9.00).

**Mean Satisfaction with Life**

The results of the Friedman Test indicated that there was not a statistically significant difference in PWI mean Satisfaction with Life scores across the three time points (pre-intervention, post-intervention, 6-mth follow-up, $\chi^2(2, n = 12) = 3.50, p = .174$). Inspection of the median values showed a small increase in Satisfaction with life scores from pre-intervention (Md = 5.26) to post-intervention (Md = 6.32) and a small decrease at follow-up (Md = 6.06).
Additional resources

To date, the ePACT website has been a private website hosted by Monash University. This means it cannot be found by a search engine such as Google. Participants gained access to the website using the link emailed by the research team. The medium term intent is to upload the program onto the SpinalHub website [www.spinalhub.org.au] to be made available for use by mental health professionals and the wider SCI community. SpinalHub is a community website for people with SCI in Victoria and throughout Australia. SpinalHub is a joint initiative of several organisations in Victoria who have an interest in supporting the SCI community.

Some mental health professionals currently working in the acute and rehabilitative setting have expressed interest in the ePACT program and potential adjustment for this setting.

To date, two manuscripts are being prepared for submission to the international peer-reviewed journal Spinal Cord.

Anticipated conference presentation at the Australian and New Zealand Spinal Cord Society

Further research:
The results of this project highlight the continuing high prevalence of mood disturbance and low satisfaction present in adults living with SCI in the Victorian community. The unfolding of this project exposed several gaps and therefore potential topics for future projects. Potential research questions include:

- What are the barriers that prevent identification of mental health problems by both clinicians and the individuals with SCI and how best can they be reduced?
- Would a standardised formal screening during every health review of all patients with SCI increase the identification of those experiencing mental health problems, leading to offers of support including ePACT?
- How feasible and acceptable would the delivery of the ePACT program customised to the acute and rehabilitative setting be?
- Would transforming the ePACT program into an app increase the reach of the program?

The study results also highlight the limited resources of this vulnerable population so a further potential research question is:

- Would a program that enabled adults living with significant disability such as SCI to access up-to-date electronic technological hardware in a more cost-efficient timely manner boost ability to access services and support and ultimately increase their satisfaction with life and community integration?
References