# Military Health Provider Training and Evaluation of a Problem-Solving Intervention to Reduce Distress and Enhance Readiness Among Service Members

*Denise C. Cooper; Lt Col (Ret.) Mark J. Bates*

**ABSTRACT**  Introduction: Department of Defense (DoD) has identified problem-solving training (PST) as a promising prevention/early intervention for mental health disorders. PST is a four-session group intervention that emphasizes building problem-solving and coping skills to mitigate emotional dysregulation and the adverse effects of stressful events. It was adapted from problem-solving therapy, which is an evidence-based, cognitive-behavioral approach that has shown effectiveness with treating depression and managing suicide risk. The current evaluation examined a pilot program that: (1) trained DoD providers in the delivery of PST, (2) conducted PST intervention groups with active duty personnel, and (3) developed PST master trainers to train other providers. Materials and Methods: Clinical (e.g., psychologists) and non-clinical (e.g., chaplains) providers attended a 2.5-day workshop of didactic coursework and experiential training on conducting PST, with a subset of providers selected to attend an additional workshop to become master trainers in PST. Providers ($n = 82$) who attended a PST Facilitator Workshop completed pre- and post-workshop assessments of self-efficacy in PST skills. Eight providers evaluated a Master Trainer Workshop. After completing workshop training, providers conducted PST intervention groups with service members ($n = 435$), who were experiencing distress, with or without a mental health diagnosis, and whose needs were appropriate for a prevention/resiliency-based skills group. Service members completed the following pre- and post-PST group outcome measures: (a) Outcome Questionnaire-30 (OQ-30) and Patient Health Questionnaire-9 (PHQ-9) as measures of distress; and (b) Brief Resilience Scale (BRS) to assess resilience, which contributes to readiness. They also completed the Social Problem Solving Inventory-Revised: Short Form (SPSI-R:S), as a process measure for the intervention. The SPSI-R:S, which assesses how individuals cope when faced with problems, includes the following subscales: (1) positive problem orientation, (2) negative problem orientation, (3) rational problem-solving, (4) impulsivity/carelessness style, and (5) avoidance style. Service members also completed a post-group evaluation of PST. Data were analyzed with descriptive statistics, paired sample *t*-tests, and correlational analyses. Results: Providers showed pre- to post-facilitator workshop increases in self-efficacy of PST skills (all $p < 0.001$) and those selected as master trainers evaluated their workshop training favorably, particularly the role-playing exercises. Analyses of pre- vs. post-PST group intervention measures among service members indicated that OQ-30 and PHQ-9 scores declined, while BRS and SPSI-R:S total scores increased (all $p < 0.001$). In addition, correlational analyses of change scores showed that the SPSI-R:S subscales negative problem orientation and avoidance style were negatively correlated with BRS and positively correlated with OQ-30 and PHQ-9 (all $p < 0.001$). Service members gave positive post-group evaluations of PST effectiveness and program materials. Conclusion: DoD providers reported increased self-efficacy in skills required for the delivery of a four-session PST group intervention after participating in a pilot program of training workshops. The pilot of the PST group intervention showed an association with improvements on service members' self-reported measures related to distress, readiness, and coping. In addition, changes in problem-solving measures were associated with changes in outcome measures. Follow-on research is needed to further investigate if PST is effective in preventing more severe forms of distress.

## INTRODUCTION

Psychological conditions (e.g., mood, anxiety, and adjustment disorders; substance abuse) account for relatively large proportions of medical encounters (i.e., total hospitalizations and ambulatory visits) among active duty personnel,[1] with mood and adjustment disorders among the leading diagnoses

assigned to hospitalized male and female service members.[2] In light of these contributions to healthcare burden and loss of work time among active duty personnel, mental health disorders are high priority targets[3] for prevention and early intervention efforts within the Department of Defense (DoD). Moreover, the Institute of Medicine highlighted[4] the need for evidence-based prevention strategies to help inform pre-clinical and clinical services for service members and their families.

DoD identified[5] problem-solving training (PST) as a promising prevention/early intervention for mental health disorders based on improvements in psychosocial functioning (e.g., reduced distress, increased resilience) observed in a Department of Veterans Affairs (VA) PST program.[6] PST is a four-session psychoeducational intervention with a

didactic group format that emphasizes building social (i.e., real life) problem-solving skills to cope with stressful events and maintain readiness while avoiding potentially stigmatizing clinical terms. This brief group intervention was adapted from problem-solving therapy,[7] which is a more extensive evidence-based cognitive-behavioral treatment that has been recommended for major depressive disorder by VA-DoD clinical practice guidelines[8] and has shown associations with improvements in mood and other aspects of psychosocial functioning.[9–18]

DoD implemented a pilot PST program based on a prior VA program[6] that focused on three skill toolkits from problem-solving therapy: (1) problem-solving multitasking; (2) "Stop, Slow Down, Think, and Act"; and (3) planful problem-solving. These toolkits have been described in detail elsewhere.[6,7] In summary, the "Problem-Solving Multitasking" toolkit focused on the following skills to manage the cognitive overload that often occurs when coping with stressful situations: (a) externalization (displaying information externally, such as writing lists); (b) visualization (visual imagery to illuminate problems and practice solutions); and (c) simplification (breaking down problems). The "Stop, Slow Down, Think, and Act" (SSTA) toolkit involved techniques to modulate negative emotional arousal, including "STOP" (behaviors to help "put on the brakes") and "Slow Down" (e.g., counting down from 10 to 1), before taking rational steps to "think" and "act" when coping with a stressful problem. The "Planful Problem Solving" toolkit included the rational problem-solving steps of defining the problem and setting realistic goals; generating alternative solutions; decision-making (developing a solution plan); and solution implementation and verification (evaluating whether efforts have been successful or need to continue).

The current evaluation examined the implementation of a pilot PST program that offered facilitator and master trainer workshops on PST to DoD providers and a four-session PST group intervention to service members. It examined the effects of PST groups on outcome measures that reflect distress (e.g., depressive symptoms) and readiness (e.g., resilience)[19] and on a process measure of the intervention. The Social Problem Solving Inventory-Revised: Short Form (SPSI-R:S)[20] was included as a process measure to examine PST-related changes in maladaptive coping approaches that are targeted by problem-solving therapy-based interventions. Prior studies of problem-solving interventions with service members have not included the SPSI-R:S.[9–12,18] The current evaluation addressed this gap in the literature by including SPSI-R:S data (including psychometric data) from active duty personnel.

It was hypothesized that providers would report increased self-efficacy in delivering PST after attending workshop training and would positively rating its suitability for the military personnel they serve. In addition, it was hypothesized that service members participating in PST groups would show improvements in depressive symptoms, general

distress, resilience, and social problem-solving after receiving the PST group intervention and would endorse the value of PST by rating it as worth recommending to others.

## METHODS

This program evaluation was conducted on the DoD component of a Joint Incentive Fund (JIF) pilot project with the VA entitled "Problem Solving Training for Behavioral Health Clinicians". A mixed methods quantitative/qualitative approach was used to evaluate the effects of this PST program and to identify opportunities to improve the program's design and performance. The Headquarters, U.S. Army Medical Research and Materiel Command's Office of Research Protections, Institutional Review Board Office determined that this program evaluation and process improvement activity does not constitute research as defined under human subjects protection regulations and does not constitute research involving human subjects per DoD Instruction 3216.02.[21]

This pilot program included three phases: (1) PST Facilitator Workshops, (2) PST Intervention Groups, and (3) PST Master Trainer Workshops. A description of the sample, procedures, and measures associated with each phase follows.

### *Phase 1: PST Facilitator Workshops*
#### Sample: DoD providers
Ninety-three clinical (e.g., psychiatrists, psychologists, and social workers) and non-clinical (e.g., chaplains) providers of mental health counseling or psycho-educational services in primary care, specialty care, embedded line, and military community settings attended one of the PST Facilitator Workshops. Complete pre- and post-workshop data were available for analysis from 82 providers.

#### Procedures
Program staff accepted applications for the PST Facilitator Workshops from providers nominated by Air Force, Army, and Navy action officers and from military chaplains who had participated in a separate DoD-VA JIF focused on chaplain and psychological health collaboration. Problem-solving therapy experts, Dr Arthur Nezu and Dr Christine Nezu, taught providers from facilities in the USA and abroad how to deliver the PST group intervention during one of the 2.5-day long workshops held at four locations (Salt Lake City, UT, USA; San Antonio, TX, USA; St. Louis, MO, USA; Washington, DC, USA).

The workshop combined didactic presentations on PST with clinical demonstrations and experiential training, while emphasizing military culture and tailoring feedback to unique aspects of this population (e.g., combat exposure). Facilitator trainees completed questionnaires before and after attending the workshop. They were asked to conduct two or more PST groups at their facilities and were provided

weekly group phone consultations for 5 months (minimum 15 calls) with an experienced PST provider to ensure protocol fidelity, receive logistical support, and obtain feedback.

## Measures

*PST Trainer Survey* – A 38-item survey was created to evaluate pre- and post-workshop differences in providers' self-efficacy and commitment related to facilitating PST groups. It included 6 subscales: (1) general confidence in administering PST to groups (2 items); (2) general therapeutic skills self-efficacy (6 items); (3) PST-specific skills self-efficacy (13 items); (4) intervention/referral self-efficacy (5 items); (5) application and utility of the PST curriculum (7 items); and (6) initiating and maintaining PST (5 items). Respondents used a six-point scale to rate their confidence (1 = "not at all" to 6 = "extremely confident") on the self-efficacy items and a five-point scale to indicate their agreement with items (1 = "strongly disagree" to 5 = "strongly agree") assessing the utility of the PST curriculum and their intentions to initiate and maintain PST. Four items were reverse scored. Subscale scores were computed as the mean of the constituent items. Higher scores indicated higher self-efficacy and commitment to conducting PST.

*PST Sustainment: Adoption and Utilization Survey* – Providers who conducted at least two PST intervention groups completed this survey, which was adapted from existing surveys[22,23] to collect quantitative and qualitative data relevant to the sustainment of PST at DoD facilities. It asked providers if they intended to conduct future PST sessions (yes/no/unsure) and to describe potential barriers and critical factors in sustaining PST. The survey included a five-point Likert scale (1 = "strongly disagree" to 5 = "strongly agree") for providers to rate how much they agreed with items on four subscales: (1) scientific strength of evidence (8 items); (2) suitability of PST for patient and facility needs (4 items); (3) leadership support at facility (10 items); and (4) availability of facility resources (4 items). The survey also included three single items for providers to rate (1 = "never" to 5 = "always") the extent of their personal usage of PST skills before and after attending the workshop and their integration of PST skills with clients outside of the PST group protocol. Higher scores on the subscales and single items indicated higher support for the sustainment of PST.

## Phase 2: PST Intervention Groups
### Sample: Active Duty Service Members

Providers who completed PST facilitator training offered the PST group intervention to service members who were: (1) experiencing some level of distress, with or without a mental health diagnosis; (2) preferably not currently engaged in mental health services; and (3) appropriate for a prevention- or resiliency-based skills group. Exclusions were: (1) need for high-intensity treatment or acute stabilization; (2) unwillingness to attend four group sessions and complete evaluation materials; and (3) inability or unwillingness to be an

active group participant. Of the 531 service members who enrolled in a PST group, 82 cases did not meet the following criteria to be counted as completed cases for analyses: (1) participation in at least three sessions; and (2) the availability of pre- and post-PST data for outcome and process measures. The final sample included 435 service members who met the criteria for complete cases.

## Procedures

Providers conducted the PST groups at their respective facilities in a classroom-type setting. Groups included at least three invited service members, who completed questionnaires before the first group session and after the final session. Each of the first three sessions emphasized one of the PST toolkits (i.e., problem-solving multitasking; "Stop, Slow Down, Think, and Act"; and planful problem-solving), followed by a fourth session focused on summary, review, and planning.[6] Providers were given uniform instructions about how to collect questionnaire data, track participants using ID numbers, label data, maintain protocol files, ensure completion of all questionnaire items, and complete a scoring spreadsheet that they returned to program staff.

## Measures

In addition to providing demographic information (i.e., age, gender, race/ethnicity, education, and military service era), service members completed four psychometrically validated psychosocial questionnaires before and after the PST group intervention that assessed key outcomes (i.e., depressive symptoms, distress, and resilience) and processes (i.e., social problem-solving). They also gave feedback about PST in a post-group questionnaire. Descriptions of these questionnaires follow.

*Patient Health Questionnaire-9 (PHQ-9)* – The PHQ-9 included a four-point scale (0 = "not at all" to 3 = "nearly every day") that respondents used to indicate how often in the past 2 weeks they had experienced nine depressive symptoms.[24] Item responses were totaled, with larger scores reflecting greater frequency of depressive symptoms (clinical cut-point $\geq 10$).

*Outcome Questionnaire for Adults-30 (OQ-30)* – The OQ-30 asked respondents to use a five-point Likert-type scale (0 = "never" to 4 = "almost always") to rate how frequently in the past week they experienced 30 items that measure symptoms of distress, problems in interpersonal relationships, and social role performance.[25] After reverse-scoring negatively worded items, responses were summed to produce a total score. Higher total OQ-30 scores reflect greater distress (clinical cut-point $\geq 44$).

*Brief Resilience Scale (BRS)* – The six items of the BRS measured the perceived ability to endure and recover from challenging life events.[26] Resilience was assessed because of its vital role in military readiness.[19] Responses were rated on a five-point Likert scale (1 = "strongly disagree" to 5 = "strongly agree"). After three items were reverse-scored,

BRS scores were computed as the mean of the six items. Higher BRS scores reflects higher perceived resilience.

*SPSI-R:S* – Respondents indicated how they usually cope with problems by rating 25 items on a five-point scale (0 = "not at all true of me" to 4 = "extremely true of me").[20] The SPSI-R:S includes five subscales (five items each): (1) positive problem orientation (PPO; optimism and belief in own problem-solving ability); (2) negative problem orientation (NPO; pessimism, self-doubt, easily frustrated); (3) rational problem-solving (RPS; prudent and evaluative); (4) impulsivity/careless style (ICS; impulsive, inattentive, or rushed); and (5) avoidance style (AS; avoid or delay dealing with problems). Item responses were summed for each subscale, with higher values indicating greater intensity of that problem-solving dimension. Total SPSI-R:S scores were calculated as the mean of the five subscales after reversal of the NPO, ICS, and AS subscales: [(PPO raw score/5) + (20 − NPO raw score)/5 + (RPS raw score/5) + (20 − ICS raw score)/5 + (20 − AS raw score)/5].[20,27,28] Higher total SPSI-R:S scores indicate more effective overall problem-solving. Internal consistency reliability was acceptable for the overall SPSI-R:S and its PPO, NPO, RPS, ICS, and AS subscales (Cronbach's $\alpha$: pre-PST = 0.73, 0.79, 0.84, 0.77, 0.79, and 0.85, respectively; post-PST = 0.81, 0.85, 0.88, 0.86, 0.82, and 0.87, respectively).

*Post-Group Questionnaire* – This 22-item questionnaire was created to ask PST group participants to rate their agreement (1 = "completely disagree" to 5 = "completely agree") with statements on the helpfulness of the program, the quality of its materials, logistics of the group sessions, and potential follow-up PST interventions. Higher post-group questionnaire scores indicated views of PST that were more favorable.

*Follow-up Checklist* – Service members who dropped out of PST groups after two or fewer sessions were asked by the provider to complete a checklist of 13 items to identify and explain reasons for their withdrawal.

### Phase 3: PST Master Trainer Workshops
### Sample: DoD Providers With Prior PST Facilitator Training

Twelve trained facilitators became "master trainers" of other providers to support sustainment of PST within DoD. Candidates nominated from each military branch by action officers and training directors underwent competitive selection based on program staff's review of written applications and video samples demonstrating PST principles. Selected candidates attended a Master Trainer Workshop and agreed to complete at least one PST training event at their facility or in their region within 12 months. Complete workshop data from eight providers were available for analysis.

### Procedures

Drs Arthur and Christine Nezu emphasized advanced didactics with experiential learning and practice delivering the PST toolkits during the 2.5-day long Master Trainer Workshops conducted in St. Louis, MO, USA and Silver Spring, MD, USA. Master trainers completed a workshop program evaluation. They received access to online PST program materials and 5 months of monthly consultation calls to support protocol adherence and development of local PST workshops.

### Measures

*Master Trainer Workshop Evaluation* – This questionnaire asked master trainers to use a five-point Likert scale (1 = "strongly disagree" to 5 = "strongly agree") to rate how much they agreed with 19 items assessing the workshop's effectiveness in improving skills relevant to PST master trainers. It also asked for written responses to three prompts: (1) what I most liked about this training; (2) what I least liked about this training; and (3) how the training could be improved. Written responses were reviewed to identify common themes.

### Statistical Analysis

Descriptive statistics, paired sample *t*-tests (pre- vs. post-PST group or workshop outcomes), Pearson's correlations (between pre-to-post-PST change scores for SPSI-R:S subscales and outcome measures), and reliability analyses (SPSI-R:S) were conducted using IBM SPSS version 23. Effect sizes were reported as Cohen's *d*. After Bonferroni correction for multiple comparisons, $p < 0.0021$ was considered significant.

## RESULTS

### PST Facilitator Workshops

*PST Trainer Survey* – Table I summarizes the pre-to-post-workshop differences in scores on the six subscales of the

**TABLE I.** Pre- to Post-Facilitator Workshop Changes in Subscale Scores on the PST Provider Survey (*n* = 82)

| Subscale | Pre-Workshop Mean (SD) | Post-Workshop Mean (SD) | Pre-to-Post Difference | *t* | *p* | *d* |
|---|---|---|---|---|---|---|
| General confidence in conducting PST groups | 1.99 (1.18) | 4.72 (0.76) | 2.73 | 20.30 | 0.000 | 2.81 |
| General therapeutic skills self-efficacy | 4.44 (0.92) | 5.01 (0.65) | 0.57 | 6.73 | 0.000 | 0.73 |
| PST-specific skills self-efficacy | 2.45 (1.01) | 4.63 (0.76) | 2.18 | 17.81 | 0.000 | 2.46 |
| Intervention/referral self-efficacy | 4.23 (1.21) | 5.17 (0.81) | 0.95 | 7.48 | 0.000 | 0.93 |
| Application and utility of the PST curriculum | 3.28 (0.42) | 3.82 (0.55) | 0.55 | 9.84 | 0.000 | 1.11 |
| Initiating and maintaining PST | 3.87 (0.62) | 4.10 (0.53) | 0.22 | 3.27 | 0.002 | 0.40 |

PST Trainer Survey. Mean scores on all subscales significantly increased after workshop completion (all $p < 0.001$, with the exception of the initiating and maintaining PST subscale, $p = 0.0020$). The largest effects of the workshop were on general confidence in administering PST to groups ($d = 2.81$) and PST-specific skills self-efficacy ($d = 2.46$).
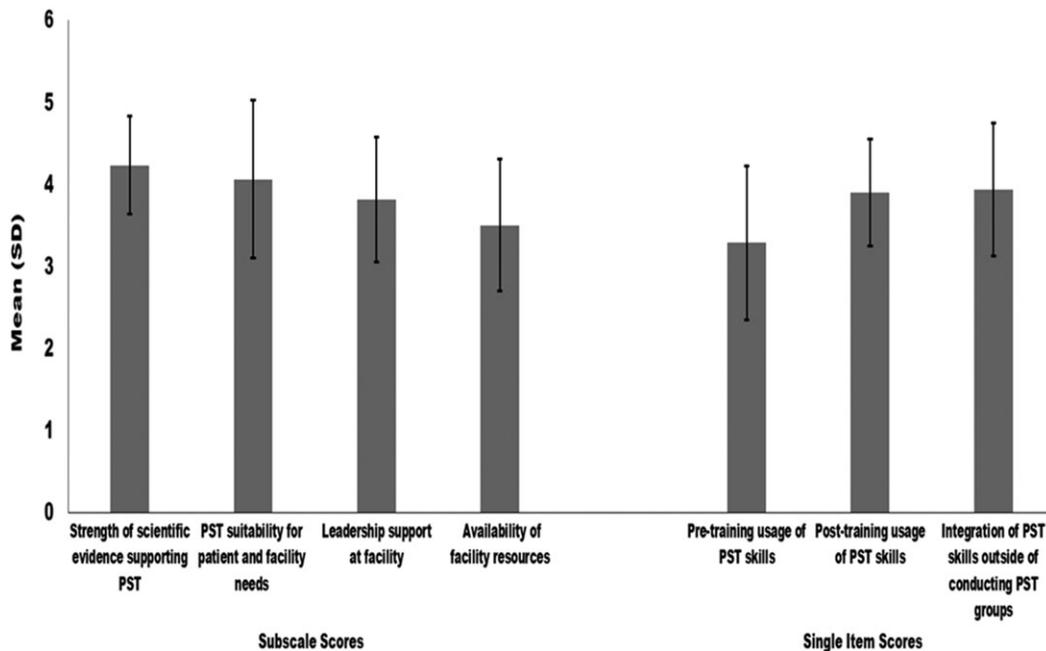
*PST Sustainment: Adoption and Utilization Survey* – Thirty-one providers completed this survey after conducting at least two PST groups. *Qualitative*: Most responses to the question about the most important factors in sustaining PST cited the availability of referrals or ease of patient recruitment (21%) and support from leadership and other staff members (17%). Responses regarding potential barriers to sustaining PST mentioned the limited availability of staff time to deliver PST (14%), insufficient patient referrals and recruitment (14%), and issues of revenue and group treatment counting for fewer relative value units than individual treatment (10%). The following were the responses when providers were asked if they intended to conduct more PST groups in the future: yes (71.0%), no (3.2%), unsure (12.9%), and no answer (12.9%). *Quantitative*: Figure 1 shows the means and standard deviations (SD) of the survey's subscales and single item

scores. Providers generally endorsed the suitability of PST for their facilities (mode = 5), as well as the scientific soundness of PST, supportiveness of leadership at their facility, and post-workshop usage of PST in treating their clients (all modes = 4). Providers indicated slightly less agreement that their facilities had adequate resources (mode = 3.5).

### PST Intervention Groups

*Demographics* – PST group members ranged in age from 18 to 63 years old (mean age ± SD: 29.28 ± 8.77 years). Sixty-nine percent of members served during the conflicts in Iraq and Afghanistan. Thirty-three percent of members were women. Group members were diverse racially (Caucasian: 51.6%; African American: 28.7%; Asian or Pacific Islander: 5.3%; American Indian or Alaskan Native: 1.2%; and 13.2% other) and ethnically (Hispanic: 15.6%). They reported the following education: high school graduate (29.1%), some college (51.0%), college graduate (11.6%), some graduate school (3.0%), and graduate degree (5.3%).

*Pre- vs. Post-PST Outcome and Process Measures* – Table II provides the results of paired sample *t*-tests comparing



**FIGURE 1.** PST sustainment: providers' mean scores (SD) on adoption and utilization survey subscales and single item measures.

**TABLE II.** Pre- to Post-PST Intervention Changes in Outcome (PHQ-9, OQ-30, BRS) and Process (SPSI-R:S) Measures Among Service Members ($n = 435$)

| Measure | Pre-PST Mean (SD) | Post-PST Mean (SD) | Pre-Post Difference | $t$ | $p$ | $d$ |
|---------|-------------------|--------------------|--------------------|-----|-----|-----|
| PHQ-9 | 10.81 (7.33) | 8.76 (6.87) | −2.05 | −9.31 | 0.000 | 0.29 |
| OQ-30 | 48.03 (23.76) | 40.70 (23.67) | −7.33 | −10.11 | 0.000 | 0.31 |
| BRS | 2.87 (0.87) | 3.18 (0.82) | 0.31 | 9.57 | 0.000 | 0.37 |
| SPSI-R:S Total | 11.52 (3.37) | 12.65 (3.25) | 1.13 | 9.74 | 0.000 | 0.34 |

**TABLE III.** Correlations (r) of Pre- to Post-PST Change Scores for SPSI-R:S Subscales With Outcome Measures Among Service Members ($n = 435$)

| | Pre- to Post-PST Change Scores | | |
|---|---|---|---|
| SPSI-R:S Subscales | PHQ-9 | OQ-30 | BRS |
| PPO | −0.06 | −0.20** | 0.20** |
| NPO | 0.31** | 0.45** | −0.34** |
| RPS | −0.07 | −0.16* | 0.21** |
| ICS | 0.16* | 0.24** | −0.18** |
| AS | 0.25** | 0.37** | −0.28** |

*$p = 0.001$; **$p = 0.000$.

pre- vs. post-PST scores on the outcome measures (i.e., PHQ-9, OQ-30, and BRS) and process measure (SPSI-R:S). Service members reported reductions in depressive symptoms and general distress, with increases in resilience and social problem-solving skills, as indicated by scores on the PHQ-9, OQ-30, BRS, and SPSI-R:S, respectively (all $p < 0.001$).

*Correlations of Change Scores for SPSI-R:S Subscales and Outcome Measures* – Table III shows that change scores (i.e., pre-to post-PST differences) for each subscale of the process measure (i.e., SPSI-R:S) were significantly correlated with at least one change score on an outcome measure (i.e., PHQ-9, OQ-30, or BRS). However, pre- to post-PST declines in PHQ-9 and OQ-30 scores and increases in BRS scores were most correlated with declines in the NPO and AS subscales (all $p < 0.001$).

*Post-Group Questionnaire* – Figure 2 shows that responses to the post-group questionnaire were largely positive, with 99% of service members indicating that they agreed at least somewhat with recommending the PST program to others. Data also show 100% and 98% saying that they agreed at least somewhat that their trainer was effective in helping them deal better with their problems and that the program helped them with their stressful problems, respectively. Similarly, 94% agreed at least somewhat with the statements that they felt more optimistic about the future and better able to reach their life goals because of the program.

*Follow-up Checklist* – Of the 47 service members who discontinued PST, 30 completed this checklist. Among the reasons for withdrawal were the inconvenient time of sessions (67%), too much paperwork to fill out (62%), too much of a time commitment (52%), too much information (52%), and transportation problems (48%). In addition, 59% disliked the group format.

### Master Trainer Workshops

The mean of responses to the Master Trainer Workshop Evaluation was 4.20 (SD: 1.15), which reflected providers' general agreement with 19 statements on the workshop's effectiveness in enhancing skills relevant to master trainers. Written responses indicated that the most liked aspects of the Master Trainer Workshops were role-plays (50%), while

the least liked aspect was the limited time for practice and role-playing (25%). Some of the suggestions for improvement included providing video clips of modeled behaviors and more time and opportunity for practice and role-plays.

### DISCUSSION

The current program evaluation found support for the feasibility and acceptability of PST implementation within DoD at two levels: (1) providers completing training to facilitate PST groups and (2) service members participating in PST groups led by trained facilitators. As hypothesized, providers reported increased self-efficacy in facilitating PST groups after participating in the workshop training and rated PST as a suitable match for their work setting and the needs of military personnel. In addition, service members showed the hypothesized post-PST group improvements in depressive symptoms, distress, resilience, and social problem-solving, which were accompanied by their ratings of PST as worthwhile enough to recommend to others.

This program trained DoD providers in facilitating PST groups and supported sustainment of PST by carefully selecting master trainers from each military branch to train providers at their facilities and within their region. Providers largely endorsed the scientific evidence for PST and its suitability for service members, but some noted potential challenges with resources and referrals that could impede sustainment of PST at their facilities. Although providers gave positive self-assessments of their post-workshop PST skills, the workshop did not include time to conduct formal assessments of individual competencies in delivering PST. Future training programs may want to include a standardized competency evaluation of PST target skills and an assessment comparing the outcomes of PST groups facilitated by clinical providers versus non-clinical providers. In addition, offering online virtual training could increase flexibility in scheduling and reduce logistical challenges (e.g., travel).

The PST intervention was developed for service members whose needs were appropriate for a prevention- or resiliency-based skills group. Although the evaluation design did not allow for assessment of PST as a preventive intervention, several preliminary studies with civilian populations suggest that problem-solving interventions may be associated with the prevention of depression[29–34] and other psychological conditions (e.g., generalized anxiety disorder and apathy).[35,36] Additional research is needed to examine if military populations show similar preventive effects of PST.

Few studies have examined how military personnel respond to problem-solving-based interventions. However, the reductions in distress and depressive symptoms observed in this 4-session program mirror the findings for a 12-session telephone-based problem-solving treatment for military personnel with mild traumatic brain injury.[11] Further investigation with a rigorous research design is needed to determine the effectiveness of the current four-session PST protocol
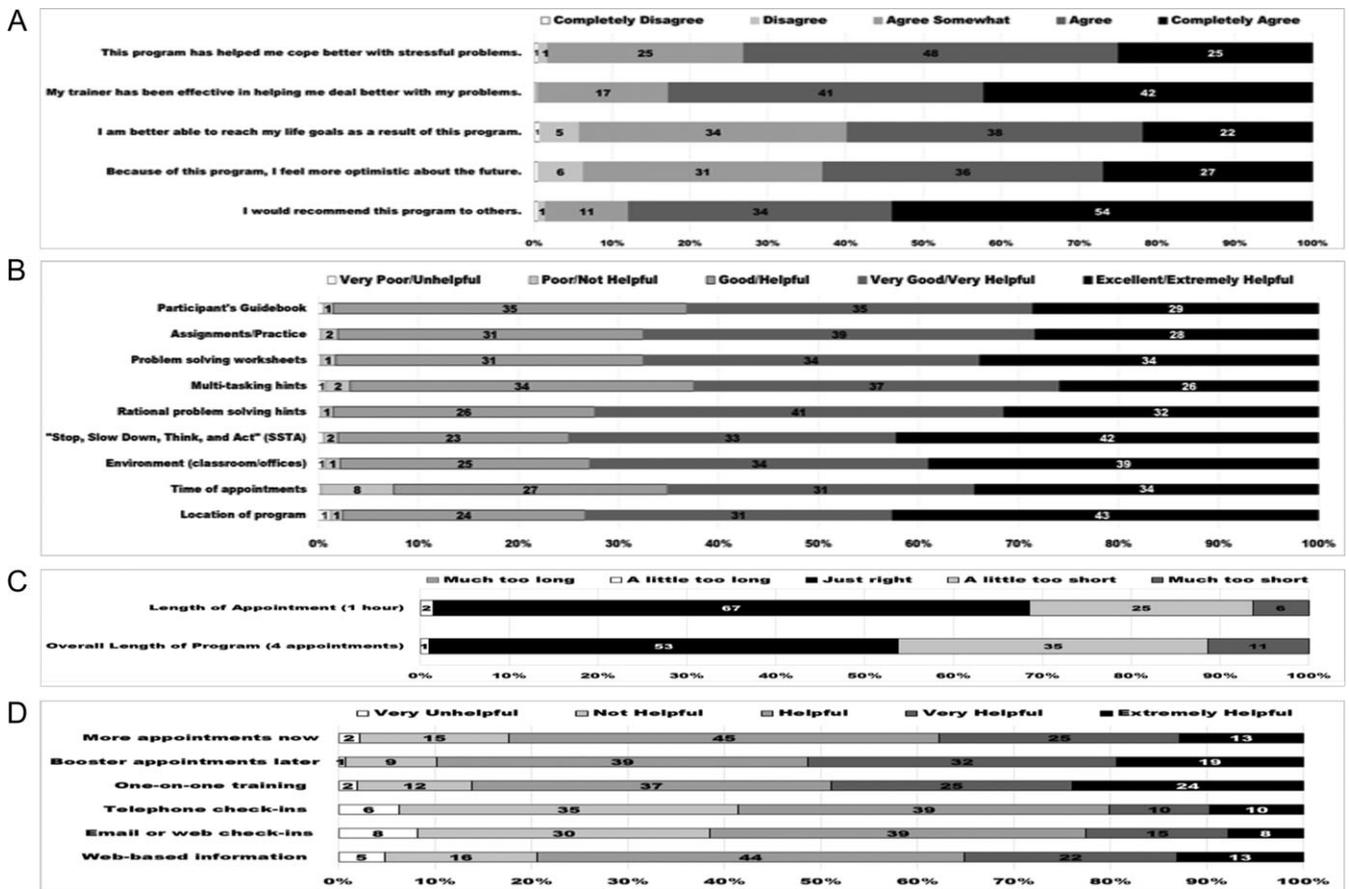
**FIGURE 2.** Service member responses (%) to Post-Group Questionnaire items for each of the following subscales: (A) personal impact of PST, (B) helpfulness of individual aspects of PST, (C) length of PST, and (D) helpfulness of potential additions to PST.

and to assess the duration of any effects associated with this brief intervention.

SPSI-R:S data were not reported for any prior studies with U.S. military personnel. The current evaluation found that pre- to post-PST reductions in SPSI-R:S scores on the NPO and AS subscales were correlated with reductions in PHQ-9 and OQ-30 scores and increases in BRS scores. This suggests that service members' improvements in outcome measures were related to their self-reported reductions in responding to problems with a pessimistic orientation of self-doubt and frustration and an avoidant or procrastinating style. Further research is needed to examine if SPSI-R:S changes in NPO and AS subscale scores are mediators of post-PST improvements in depressive symptoms, general distress, and resilience among service members.

The SPSI-R:S full scale and subscales demonstrated adequate internal reliability with this sample of service members. Their scores were largely consistent with those reported by the VA,[6] though that sample was older, included a higher proportion of men, and showed higher pre-intervention scores on the PHQ-9 and OQ-30.

The current evaluation had several strengths. The mixed methods approach allowed for the integration of quantitative and qualitative data to assess the overall PST program. It was strengthened by the collection of data from both providers and a diverse sample of PST group intervention participants at DoD sites throughout the USA and abroad. The evaluation of the effects of PST groups was strengthened by the use of psychometrically validated measures, which allowed for examination of how changes in PST constructs related to changes in outcomes. It also may be the first report of data from service members on the SPSI-R:S.

Limitations include the lack of a randomized controlled trial and the absence of data on symptom severity, clinical diagnoses, or treatment history among PST group participants. In addition, the transient nature of military life affected the participation of providers and service members, which reduced the sample of complete cases available for analyses. Finally, results should be interpreted cautiously because several questionnaires developed for the evaluation were not empirically validated on a broader sample.

## CONCLUSIONS

This evaluation found support for the feasibility and acceptability of PST among DoD providers and active duty

personal. The PST group intervention showed associations with favorable effects on measures reflecting distress, readiness, and coping among service members. These results provide a basis for pursuing subsequent research with stronger designs (e.g., longitudinal, controlled trial) to investigate if PST is effective in preventing progression to more severe forms of distress among service members.

## REFERENCES

1. Armed Forces Health Surveillance Branch: Absolute and relative morbidity burdens attributable to various illnesses and injuries, active component, U.S. Armed Forces, 2016. MSMR 2017a; 24(4): 2–8.
2. Armed Forces Health Surveillance Branch: Hospitalizations, active component, U.S. Armed Forces, 2016. MSMR 2017b; 24(4): 9–15.
3. Department of Defense. Report on Preliminary Mental Health Screenings for Individuals Becoming Members of the Armed Forces. Available at https://health.mil/Reference-Center/Reports/2017/01/11/Report-on-Preliminary-Mental-Health-Screenings; accessed February 1, 2018.
4. Institute of Medicine: Preventing Psychological Disorders in Service Members and Their Families: An Assessment of Programs. Washington, DC, National Academies Press, 2014. Available at https://doi.org/10.17226/18597.
5. Department of Defense and Department of Veterans Affairs. Final report on Integrated Mental Health Strategic Action #24: Resilience programs. Washington, DC, Department of Defense and Department of Veterans Affairs, 2012.
6. Tenhula WN, Nezu AM, Nezu CM, et al: Moving forward: a problem-solving training program to foster veteran resilience. Prof Psychol Res Pr 2014; 45(6): 416–24.
7. Nezu AM, Nezu CM, D'Zurilla TJ: Problem-Solving Therapy: A Treatment Manual. New York, Springer Publishing, 2013.
8. Management of Major Depressive Disorder Working Group. VA/DoD clinical practice guideline for the management of major depressive disorder. Washington, DC, Department of Veterans Affairs and Department of Defense, 2016. Available at http://www.healthquality.va.gov/guidelines/MH/mdd/VADoDMDDCPGFINAL82916.pdf; accessed August 29, 2018.
9. Barnes SM, Monteith LL, Gerard GR, Hoffberg AS, Homaifar BY, Brenner LA: Problem-solving therapy for suicide prevention in veterans with moderate-to-severe traumatic brain injury. Rehabil Psychol 2017; 62(4): 600–8.
10. Bell KR, Brockway JA, Fann JR, et al: Concussion treatment after combat trauma: development of a telephone based, problem solving intervention for service members. Contemp Clin Trials 2015; 40: 54–62.
11. Bell KR, Fann JR, Brockway JA, et al: Telephone problem solving for service members with mild traumatic brain injury: a randomized clinical trial. J Neurotrauma 2017; 34(2): 313–21.
12. Brockway JA St, De Lore J, Fann JR, et al: Telephone-delivered problem-solving training after mild traumatic brain injury: qualitative analysis of service members' perceptions. Rehabil Psychol 2016; 61(3): 221–30.
13. Cuijpers P, de Wit L, Kleiboer A, Karyotaki E, Ebert DD: Problem-solving therapy for adult depression: an updated meta-analysis. Eur Psychiatry 2017; 48: 27–37.
14. Easom LR, Wang K, Moore RH, Wang H, Bauer L: Operation family caregiver: problem-solving training for military caregivers in a community setting. J Clin Psychol 2018; 74(4): 536–53.
15. Kasckow J, Klaus J, Morse J, et al: Using problem solving therapy to treat veterans with subsyndromal depression: a pilot study. Int J Geriatr Psychiatry 2014; 29(12): 1255–61.
16. Malouff JM, Thorsteinsson EB, Schutte NS: The efficacy of problem solving therapy in reducing mental and physical health problems: a meta-analysis. Clin Psychol Rev 2007; 27(1): 46–57.
17. Nichols LO, Martindale-Adams J, Graney MJ, Zuber J, Burns R: Easing reintegration: telephone support groups for spouses of returning Iraq and Afghanistan service members. Health Commun 2013; 28(8): 767–77.
18. Vuletic S, Bell KR, Jain S, et al: Telephone problem-solving treatment improves sleep quality in service members with combat-related mild traumatic brain injury: results from a randomized clinical trial. J Head Trauma Rehabil 2016; 31(2): 147–57.
19. Chairman of the Joint Chiefs of Staff: Instruction: Chairman's Total Force Fitness Framework (CJCSI 3405.01), 2011. Available at http://www.jcs.mil/Portals/36/Documents/Library/Instructions/3405_01.pdf?ver=2016-02-05-175032-517; accessed February 15, 2018.
20. D'Zurilla TJ, Nezu AM, Maydeu-Olivares A: Manual for the Social Problem-Solving Inventory – Revised. North Tonawanda, NY, Multi-Health Systems, 2002.
21. Department of Defense: Instruction: Protection of Human Subjects and Adherence to Ethical Standards in DoD-Supported Research (32160.02), 2011. Available at http://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodi/321602p.pdf; accessed April 9, 2018.
22. Helfrich CD, Li YF, Sharp ND, Sales AE: Organizational Readiness to Change Assessment (ORCA): development of an instrument based on the Promoting Action on Research in Health Services (PARIHS) framework. Implement Sci 2009; 4: 38.
23. Swain K, Whitley R, McHugo GJ, Drake RE: The sustainability of evidence-based practices in routine mental health agencies. Community Ment Health J 2010; 46(2): 119–29.
24. Kroenke K, Spitzer RL, Williams JBW: The PHQ-9: validity of a brief depression severity measure. J Gen Intern Med 2001; 16(9): 606–13.
25. Lambert MJ, Morton JJ, Hatfield D, et al: Administration and Scoring Manual for the Outcome Questionnaire-45. Orem, UT, American Professional Credentialing Services, 2004.
26. Smith BW, Dalen J, Wiggins K, Tooley E, Christopher P, Bernard J: The brief resilience scale: assessing the ability to bounce back. Int J Behav Med 2008; 15(3): 194–200.
27. Jaffee WB, D'Zurilla TJ: Adolescent problem solving, parent problem solving, and externalizing behavior in adolescents. Behav Ther 2003; 34: 295–311.
28. Ma J, Xiao L, Lv N, et al: Profiles of sociodemographic, behavioral, clinical and psychosocial characteristics among primary care patients with comorbid obesity and depression Prev Med Rep 2017; 8: 42–50.
29. Buntrock C, Ebert DD, Lehr D, et al: Effect of a web-based guided self-help intervention for prevention of major depression in adults with subthreshold depression: a randomized clinical trial. JAMA 2016; 315(17): 1854–63.
30. Silverstein M, Diaz-Linhart Y, Cabral H, et al: Efficacy of a maternal depression prevention strategy in head start: a randomized clinical trial. JAMA Psychiatry 2017; 74(8): 781–9.
31. Arean P, Hegel M, Vannoy S, Fan MY, Unuzter J: Effectiveness of problem-solving therapy for older, primary care patients with depression: results from the IMPACT project. Gerontologist 2008; 48(3): 311–23.
32. Robinson RG, Jorge RE, Moser DJ, et al: Escitalopram and problem-solving therapy for prevention of poststroke depression: a randomized controlled trial. JAMA 2008; 299(20): 2391–400.

33. Vázquez FL, Otero P, Torres A, Hermida E, Blanco V, Díaz O: A brief problem-solving indicated-prevention intervention for prevention of depression in nonprofessional caregivers. Psicothema 2013; 25(1): 87–92.

34. Rovner BW, Casten RJ: Preventing late-life depression in age-related macular degeneration. Am J Geriatr Psychiatry 2008; 16(6): 454–9.

35. Mikami K, Jorge RE, Moser DJ, et al: Prevention of poststroke apathy using escitalopram or problem-solving therapy. Am J Geriatr Psychiatry 2013; 21(9): 855–62.

36. Mikami K, Jorge RE, Moser DJ, et al: Prevention of post-stroke generalized anxiety disorder, using escitalopram or problem-solving therapy. J Neuropsychiatry Clin Neurosci 2014; 26(4): 323–8.