A Comparison of the Efficacy of Psychotherapy via Telemedicine to Traditional In-Person Therapy for Rural Veterans with PTSD

Melissa Walsh
Pacific University
A Comparison of the Efficacy of Psychotherapy via Telemedicine to Traditional In-Person Therapy for Rural Veterans with PTSD

Abstract

Background: The shortage of medical providers in rural areas is one of the greatest barriers to accessing healthcare in the United States. Mental healthcare providers are especially limited in numbers and availability in rural areas. Although all individuals living rurally have challenges with receiving care, one group that demonstrates an exceptional deficiency with access to care is veterans. The numbers of veterans living rurally are significantly higher than vets living close to urban or suburban centers of care. Considering the shortages of mental health providers, alternatives to traditional in-person therapy are needed in order to adequately address the needs of rurally located veterans. Recently, psychotherapy via video teleconferencing has been suggested as a way of reaching a greater number of veterans. But is this approach equivalent to in-person therapy in the treatment of PTSD?

Methods: An exhaustive search was conducted using Medline-OVID, CINAHL, and Google Scholar using the keywords: mental health, veterans, rural, and telemedicine. Relevant articles were assessed for quality using GRADE.

Results: Three studies met the search criteria and were included in this systematic review. The first study, Frueh et al, is a randomized controlled study (RCT) to compare the efficacy of psychotherapy delivered via video teleconferencing or in-person therapy for combat-related PTSD. This study showed a comparable treatment effect and patient satisfaction between the two different methods. The second study, Morland et al, is a non-inferiority-designed RCT comparing anger management therapy delivered either by video teleconferencing or same-room therapy to veterans with PTSD. This study demonstrated similar satisfaction in both groups and an improvement in both anger and PTSD symptoms in the video teleconferencing group. The third study, Ziemba et al, is a two-arm RCT with either active-duty or veterans of Operation Enduring Freedom or Operation Iraqi Freedom comparing psychotherapy administered via video teleconferencing or in-person. This study indicated equivalence between the two types of therapies.

Conclusion: Psychotherapy administered to veterans with PTSD living in rural areas via video teleconferencing has been shown to be equivalent to traditional in-person therapy. Multiple studies show promise for a broader application of psychotherapy via video teleconferencing to help with the shortage of mental health providers in rural areas; however, further studies are needed to investigate the extent to which telemedicine can be used effectively.

Keywords: Mental health, telemedicine, video teleconferencing, veterans.

Degree Type
Capstone Project

Degree Name
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Keywords
Mental health, telemedicine, video teleconferencing, veterans

Subject Categories
Medicine and Health Sciences

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A Comparison of the Efficacy of Psychotherapy via Telemedicine to Traditional In-Person Therapy for Rural Veterans with PTSD

Melissa N. Walsh

A Clinical Graduate Project Submitted to the Faculty of the School of Physician Assistant Studies Pacific University Hillsboro, OR For the Masters of Science Degree, August 2014

Faculty Advisor: Dr. Pedemonte
Clinical Graduate Project Coordinator: Annjanette Sommers, PA-C, MS
Melissa Walsh is a native of California. She received a Bachelor of Science degree in Medical Technology from University of the Sciences in Philadelphia. Following graduation she worked as a Transfusion Medicine Specialist. Additionally, she spent time working at a biotech company in the Clinical Operations and Regulatory Affairs Departments helping with an IND submission to the FDA. She decided to pursue a career as a Physician Assistant in order work more closely with patients. She has strong interests in family medicine in rural, underserved areas.
ABSTRACT

Background: The shortage of medical providers in rural areas is one of the greatest barriers to accessing healthcare in the United States. Mental healthcare providers are especially limited in numbers and availability in rural areas. Although all individuals living rurally have challenges with receiving care, one group that demonstrates an exceptional deficiency with access to care is veterans. The numbers of veterans living rurally are significantly higher than vets living close to urban or suburban centers of care. Considering the shortages of mental health providers, alternatives to traditional in-person therapy are needed in order to adequately address the needs of rurally located veterans. Recently, psychotherapy via video teleconferencing has been suggested as a way of reaching a greater number of veterans. But is this approach equivalent to in-person therapy in the treatment of PTSD?

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Conclusion: Psychotherapy administered to veterans with PTSD living in rural areas via video teleconferencing has been shown to be equivalent to traditional in-person therapy. Multiple studies show promise for a broader application of psychotherapy via video teleconferencing to help with the shortage of mental health providers in rural areas; however, further studies are needed to investigate the extent to which telemedicine can be used effectively.

Keywords: Mental health, telemedicine, video teleconferencing, veterans.
Acknowledgements

For my loving husband who’s meditation for me through my journey has been “You were born for this”. It has served as both an inspiration and a kick in the rear end. To my mom for instilling in me a love of science and exemplifying what it means to be a successful, powerful woman. Thank you dad for teaching me that speaking softly is often the best way to help others hear your voice. Your lessons of integrity and compassion have helped me to always find and maintain my priorities.
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**LIST OF ABBREVIATIONS**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>BDI</td>
<td>Beck Depression Inventory</td>
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<tr>
<td>CAPS</td>
<td>Clinician-Administered PTSD Scale</td>
</tr>
<tr>
<td>CI</td>
<td>Confidence Interval</td>
</tr>
<tr>
<td>CPOSS-VA</td>
<td>Charleston Psychiatric Outpatient Satisfaction Scale-VA PTSD</td>
</tr>
<tr>
<td>CPT-C</td>
<td>Cognitive Processing Therapy with cognitive therapy</td>
</tr>
<tr>
<td>DOD</td>
<td>Department of Defense</td>
</tr>
<tr>
<td>FDA</td>
<td>Food and Drug Administration</td>
</tr>
<tr>
<td>FTF</td>
<td>Face to Face</td>
</tr>
<tr>
<td>GRADE</td>
<td>Grading of Recommendations, Assessment, Development and Evaluations</td>
</tr>
<tr>
<td>IND</td>
<td>Investigational New Drug</td>
</tr>
<tr>
<td>NAS-T</td>
<td>Novaco Anger Scale total score</td>
</tr>
<tr>
<td>OEF</td>
<td>Operation Enduring Freedom</td>
</tr>
<tr>
<td>OIF</td>
<td>Operation Iraqi Freedom</td>
</tr>
<tr>
<td>PTSD</td>
<td>Post Traumatic Stress Disorder</td>
</tr>
<tr>
<td>PCL-M</td>
<td>PTSD Checklist-Military Version</td>
</tr>
<tr>
<td>RCT</td>
<td>Randomized Controlled Trial</td>
</tr>
<tr>
<td>SCL-90-R</td>
<td>Symptom Checklist-90-Revised</td>
</tr>
<tr>
<td>SD</td>
<td>Standard Deviation</td>
</tr>
<tr>
<td>SF-36v2</td>
<td>Short Form 36 Health Survey</td>
</tr>
<tr>
<td>STAXI-2</td>
<td>State Trait Anger Expression Inventory-2</td>
</tr>
<tr>
<td>T-ANG</td>
<td>10-item Trait Anger</td>
</tr>
<tr>
<td>TM</td>
<td>Telemedicine</td>
</tr>
<tr>
<td>VA</td>
<td>Department of Veterans Affairs</td>
</tr>
<tr>
<td>VAMC</td>
<td>Veterans Administration Medical Center</td>
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</table>
A Comparison of the Efficacy of Psychotherapy via Telemedicine to Traditional Face-to-Face Therapy for Rural Veterans with PTSD

BACKGROUND

The shortage of medical providers in rural communities presents one of the greatest challenges in delivering healthcare.¹ This is particularly true of mental healthcare.¹² One population greatly affected by lack of care in rural areas is veterans. According to the Veterans Health Administration Office of Rural Health (VA ORH), “veterans from geographically rural areas make up a disproportionate share of service members”.³ Veterans also have higher rates of mental health issues than the general population, specifically Post Traumatic Stress Disorder (PTSD). PTSD has been linked to combat stressors including, increased exposure,⁴ survivability following combat sustained injury,⁵ and the number of deployments.⁶

Cognitive behavioral therapies such as exposure therapy are considered to be first line treatments of PTSD by the Department of Veterans Affairs (VA) and Department of Defense (DOD).⁷ Veterans living rurally however, are less likely to seek behavioral health treatment because of the limited availability of providers.⁸ The VA ORH continues to seek ways of addressing this disparity.³ One possible solution is the use of telemedicine. Past research has demonstrated that psychiatric interviewing performed via telemedicine is reliable. High levels of patients and provider satisfaction with care have also been observed.⁹,¹⁰ However, until recently there was little evidence to support the efficacy of using telemedicine to treat mental illness. Although telemedicine can employ different modalities, this review will focus on studies that specifically used video teleconferencing for treatment. Since in-person psychotherapy is the gold standard for
treating many types of mental illness, including PTSD, one way to determine the efficacy of telemedicine is to compare treatment groups receiving either therapy in-person or via telemedicine.

As healthcare has expanded to include more people, finding a way to provide care to individuals in geographically isolated areas is increasingly important. As it is now, veterans living in these rural areas often fall through the cracks. Since they commonly have lingering ill effects on their health after providing service to our country, determining a way to address their needs is arguably one of the most important current healthcare issues. Programs such as telemedicine could be a way to provide greater outreach to our service men and women. Thus, it is important to determine if psychotherapy delivered via telemedicine is as effective as traditional face-to-face therapy.

**METHODS**

An exhaustive search was conducted using Medline-OVID, CINAHL, and Google Scholar using the keywords: mental health, veterans, rural, and telemedicine. The references of relevant studies were also screened for potential articles. After the initial search only articles written in the English language were considered. Articles discussing telemedicine techniques other than video teleconferencing were excluded. Grading of Recommendations, Assessment, Development and Evaluation (GRADE)\textsuperscript{11} was employed to evaluate the quality of the relevant articles.
RESULTS

The initial database search returned 76 studies. After the articles were screened for eligibility, two articles\textsuperscript{12,13} met the inclusion criteria. A search of references revealed one additional article.\textsuperscript{14} See Table I.

Frueh et al

The Frueh et al study\textsuperscript{14} is a randomized controlled trial (RCT) comparing the efficacy of psychotherapy delivered via video teleconferencing or in-person therapy for combat-related PTSD. The patients were recruited from a Veterans Administration Medical Center (VAMC) either through physician or self-referral. Inclusion criteria mandated that the patients met diagnostic criteria for PTSD as defined by the DSM IV, were non-psychotic, and were not presently abusing any substances. After recruitment, patients were randomized to their group using an urn randomization procedure.\textsuperscript{15} The study ran for 14 weeks with weekly sessions and clinical interviews were conducted prior to treatment and three months following study completion. Additionally, patients reported psychiatric symptoms through several self-reported surveys prior to treatment, after treatment, and at a 3-month follow up. Satisfaction with treatment was also self-reported via the Charleston Psychiatric Outpatient Satisfaction Scale-VA PSTD Version (CPOSS-VA) at week 4 and following treatment.\textsuperscript{14}

A total of 38 patients were randomized after screening for eligibility and consent. Treatment groups were balanced with regards to baseline characteristics including: demographics, psychiatric diagnosis, trauma exposure, and baseline mental health assessment scores. Of the patients in the telemedicine (TM) group (n=17), eight participants did not complete the 90 minute weekly sessions. Comparatively, nine
patients in the same-room group (n=21) did not complete the therapy. A total of five patients, two from the TM group and three from the same-room group, were lost to follow up during the 3-month follow up phase of the study.14

Clinical outcomes were measured by self-reported surveys. The 17-item PTSD Checklist-M (PCL-M)16 was used to evaluate PTSD symptom severity. The Symptom Checklist-90-Revised (SCL-90-R)17 measured overall psychiatric functioning. The Beck Depression Inventory (BDI)18 evaluated symptoms of depression. Patients were also asked to rate their social activities inside the home, social activities outside the home, and the quality of their social relationships as further evidence of their psychiatric functioning.14 Of note was the change in the PCL scores from baseline to 3-month follow-up. At 3-month follow up, the change from baseline in the TM group was -2.67. In the same-room group the change from baseline at the 3-month follow up was 0.22. The p-value was 0.67, which indicates there is no statistical significance between the two groups. In other words, both groups showed little change in the severity of their PTS symptoms. See Table II.

The authors cited several limitations to this study. High levels of pathology and psychiatric comorbidity were hypothesized to be responsible for low rates of clinical change (improvement) in both groups.19 Small sample size may have also resulted in low power for detecting treatment differences. Finally, they noted, “high drop-out rate post randomization may have resulted in bias comparison between samples.” Based on the results with the noted limitations of the study, the authors cautiously suggest that telemedicine may be effectively used in the treatment of PTSD.14
Morland et al

Morland et al\textsuperscript{12,20} is a non-inferiority-designed RCT comparing anger management therapy delivered either by video teleconferencing or same-room therapy to veterans with PTSD in a group setting. Patients were recruited from three VA clinical sites and three vet Centers on the islands of Hawaii, Maui, and Oahu. To be included in the study the veterans had to have a current or lifetime diagnosis of PTSD as determined by Clinician-Administered PTSD Scale (CAPS)\textsuperscript{21} and a stable medication regimen for a minimum of two months prior to beginning the study. Additionally, a score of $\geq 20$ on the 10-item Trait Anger (T-ANG) subscale of the State-Trait Anger Expression Inventory-2 (STAXI-2) were needed in order to demonstrate a moderate to severe anger problem.\textsuperscript{22} Patients were excluded if they had active psychosis, suicidal or homicidal ideation, or substance dependence. “Females veterans were excluded due to their small numbers at participating clinics and the resulting inability to establish a therapeutic gender mix within the groups.”\textsuperscript{9} Significant history of other mental illnesses was also disqualifying.\textsuperscript{12,20}

After eligibility and consent, an off-site statistician randomly assigned patients to a treatment group. The goal was to form nine groups of 14 patients (7=TM, 7=FTF) at four different clinical sites. Of the 61 patients assigned to the TM group 11 were lost to follow up over the course of the study. The FTF group began with 64 patients and 20 were lost to follow up. There were no statistically significant differences of baseline characteristics between the groups.

The study consisted of two sessions per week for six weeks. Both groups received Cognitive Processing Therapy with cognitive therapy only (CPT-C). Assessments of both
self-reported clinical and process outcomes were measured at baseline, mid-treatment, post-treatment, and three and six months post-treatment. Clinical outcomes included anger expression and trait (STAXI-2), PTSD symptoms (PCL-M), and the cognitive, arousal, and behavioral aspects of anger (NAS-T).\textsuperscript{9,14} Attrition, treatment adherence, treatment expectancy, and group therapeutic alliance were the measured process outcomes. Patient satisfaction, measured by the CPOSS-VA, was also considered to be a process variable.\textsuperscript{9,14}

Both groups demonstrated improvement on the anger analysis surveys, STAXI-2, PCL-M, and Novaco Anger Scale\textsuperscript{23} total score (NAS-T) at post-treatment and the 3-month timeframe. “The upper limit of the CI is below the minimum clinically meaningful difference, indicating that the video teleconferencing was non-inferior to in-person.”\textsuperscript{12} Results continued to demonstrate non-inferiority at six months post-treatment on the STAXI-2 however the large Standard Deviation (SD) of the NAS-T scores prevented analysis. Overall, the analysis demonstrated a slightly larger improvement with video teleconferencing with regards to the anger trait. Evaluation of PTSD symptoms revealed improvement across both groups but the data did not statistically prove non-inferiority.\textsuperscript{12,20}

The authors state that while the study does confirm that video teleconferencing is an acceptable and safe way of providing psychotherapy to veterans with anger or PTSD issues there are several items the study did not address. Some of the limitations discussed include the lack of investigation of the overall effects of anger or PTSD symptom improvement on other domains of life and the effectiveness of using video teleconferencing to treat mental conditions with acute safety concerns. The study also
failed to assess whether patients used to traditional therapy would be able to transition effectively to using video teleconferencing. More studies are needed to address these concerns and to understand how to incorporate telemedicine into current health care practices.\textsuperscript{12,20}

\textbf{Ziemba et al}

Ziemba et al\textsuperscript{13} is a two-arm RCT with either active-duty or veterans of Operation Enduring Freedom (OEF) or Operation Iraqi Freedom (OIF) comparing video teleconferencing and in-person psychotherapy. Male or female active-duty and veterans of OEF and/or OIF with either a suspicion or a previously confirmed diagnosis of PTSD were recruited for the study using a combination of presentations, electronic, and print media. Eligible subjects had the diagnosis of PTSD confirmed by a contracted psychiatrist as part of the screening process. Any patients started on psychiatric medication by the study psychiatrist had enrollment delayed by 30 days to ensure medication stability. Enrolled patients were randomized in a 1:1 manner using a computer algorithm.

Patients were given 15 weeks to complete 10 therapy sessions. A licensed clinical therapist was in charge of conducting therapy sessions while a research rater administered both the pre and post assessments. The research rater was blinded to the subject’s therapy type. A fidelity consultant was also used to review and rate therapy sessions to ensure therapist adherence to and competence with the therapy protocol. Evaluations including CAPS, Montgomery-Asberg Depression Rating Scale (MADRS),\textsuperscript{24} and Hamilton Anxiety Rating Scale (HAM-A)\textsuperscript{25} which evaluated the symptoms of PTSD, depression, and anxiety were conducted both prior to and following treatment. Physical health was
also evaluated by the Short Form 36 Health Survey (SF-36v2)\textsuperscript{26} as a means of evaluating the effect of PTSD on quality of life. Finally, satisfaction with care was evaluated via a survey developed for the study by Press Ganey (South Bend, IN) upon completion of the trial.\textsuperscript{13}

A total of 18 patients were randomized however, five were lost to follow up. Both groups of patients demonstrated improvement with regards to mental health with the telemedicine group improving more (TM +45.8\%, FTF +37.9\%). Physical health remained relatively unchanged in both groups (TM + 4.4\%, FTF + 4.5\%).\textsuperscript{13}

The greatest limitation of the study was its inability to demonstrate statistical significance of results due to small sample size. Additionally, the travel distance needed for some subjects to participate may have influenced the results. Overall, the authors determined that the study could be used to estimate trends in the effectiveness and clinical significance of video teleconferencing.\textsuperscript{13}

**DISCUSSION**

Studies have had promising results in demonstrating that telemedicine, specifically video teleconferencing, is an effective form of psychotherapy to provide care to Veterans living in rural communities.\textsuperscript{12-14} While the primary focus of this review has been using video teleconferencing to treat PTSD, there are other available studies which demonstrate positive outcomes with other mental health conditions such as anger management\textsuperscript{12}, depression,\textsuperscript{27} and anxiety.\textsuperscript{28} All three studies reviewed compare video teleconferencing to in-person psychotherapy using a RTC model.

Of the three studies, the Morland et al study\textsuperscript{12,20} was the most complete assessment in terms of diversity and quantity of veterans, but there was an imbalance in
the patients lost to follow up where 11 of 61 were lost in the telemedicine group while 20 of 64 were lost in the in person group. The Frueh et al \textsuperscript{14} and Ziemba et al \textsuperscript{13} had much smaller sample sizes and thus no statistical significance is gleaned from the data. However, conclusions were drawn based on encouraging trends. This lack of sample size indicates a need for further studies. See Table I.

While research from these studies is encouraging, further RCT studies are needed to fully address efficacy as well as long-term treatment effects. In order to gain the sample size needed to see relevant effect non-veterans may need to be included. In that case, researchers may need to further stratify the type of trauma associated with the PTSD to ensure that a difference between study subjects does not create inconsistency in the results.

The majority of the results of these studies were self-reported. While the evaluations given are designed to produce an accurate picture of a patient’s symptoms and severity of symptoms, it is still a subjective measurement. Further investigations may try implementing a system incorporating both patient questionnaires and a separate evaluation by an off-site mental health professional. A correlation between these two types of evaluations may provide proof of efficacy.

The trends in the research do support using psychotherapy via video teleconferencing as an alternative to in-person therapy. For patients in a rural setting or without access to a mental health provider this type of intervention is recommended. Both patients and providers should give close attention to progress and satisfaction in order to ensure successful treatment of the patient.
CONCLUSION

Psychotherapy administered to veterans with PTSD living in rural areas via video teleconferencing has been shown to be equivalent to traditional in-person therapy. Similar levels of satisfaction with care are also noted when comparing the two methods. Although recruitment can be challenging in remote areas, results have been consistent over multiple studies. PTSD symptoms were the primary interest but other psychological pathologies (anger) also showed improvement with video teleconferencing. The combined quality of the evidence for the reviewed studies based on the GRADE criteria is low; however, these studies show promise for broader application psychotherapy via video teleconferencing to help with a shortage of mental health providers in rural areas. Further studies are needed to investigate the extent to which telemedicine can be used to treat different types of mental illness and if its effects are broad enough to positively influence other domains of life.
REFERENCES


   [http://dx.doi.org/10.4088/JCP.09m05604blu](http://dx.doi.org/10.4088/JCP.09m05604blu). Accessed 20100729.


### TABLE I. Characteristics of Reviewed Studies, Grade Profile

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<thead>
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<th>Quality Assessment</th>
<th>Downgrade Criteria</th>
<th>Quality</th>
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<tbody>
<tr>
<td>Studies Design Limitations Indirectness Imprecision Inconsistency Publication bias likely</td>
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<td></td>
</tr>
<tr>
<td><strong>PTSD Symptoms</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frueh et al</td>
<td>RCT</td>
<td>No serious limitations</td>
</tr>
<tr>
<td>Morland et al</td>
<td>RCT</td>
<td>No serious limitations</td>
</tr>
<tr>
<td>Ziemba et al</td>
<td>RCT</td>
<td>No serious limitations</td>
</tr>
<tr>
<td><strong>Patient Satisfaction</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frueh et al</td>
<td>RCT</td>
<td>No serious limitations</td>
</tr>
<tr>
<td>Morland et al</td>
<td>RCT</td>
<td>No serious limitations</td>
</tr>
<tr>
<td>Ziemba et al</td>
<td>RCT</td>
<td>No serious limitations</td>
</tr>
</tbody>
</table>

*Risk for performance bias due to inability to blind providers and patients in the Frueh et al, Morland et al, and Ziemba et al studies.

*Non-inferiority analysis used in the Frueh et al study and the Morland et al study and strong use of self-reported data in all studies.

*Small sample sizes and/or large lost to follow up in all studies.
### TABLE II. Clinical Outcomes, Frueh et al

<table>
<thead>
<tr>
<th>Survey</th>
<th>Same-room mean (SD, n)</th>
<th>Telepsychiatry mean (SD, n)</th>
<th>Same-room mean (SD, n)</th>
<th>Telepsychiatry mean (SD, n)</th>
<th>P</th>
<th>3 month follow-up</th>
<th>3 month follow-up change-from-baseline</th>
<th>Lower limit of one-sided 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCL</td>
<td>62.38 (12.8, 21)</td>
<td>67.00 (9.4, 17)</td>
<td>65.66 (16.1, 12)</td>
<td>68.11 (11.0, 9)</td>
<td>0.39</td>
<td>-12.9</td>
<td>60.56 (9.6, 9)</td>
<td>1.78 (11.0, 9)</td>
</tr>
<tr>
<td>BDI</td>
<td>24.43 (8.6, 21)</td>
<td>24.41 (11.2, 17)</td>
<td>25.17 (7.6, 12)</td>
<td>27.56 (11.0, 9)</td>
<td>0.65</td>
<td>-7.0</td>
<td>27.67 (7.5, 9)</td>
<td>-0.01 (0.6, 9)</td>
</tr>
<tr>
<td>SCL-90-R</td>
<td>2.02 (0.8, 21)</td>
<td>2.21 (0.8, 17)</td>
<td>1.85 (0.6, 12)</td>
<td>2.41 (0.9, 9)</td>
<td>0.97</td>
<td>-0.4</td>
<td>1.89 (0.9, 9)</td>
<td>2.22 (1.0, 7)</td>
</tr>
<tr>
<td>Social activities inside home</td>
<td>1.85 (3.4, 20)</td>
<td>0.81 (1.3, 16)</td>
<td>1.83 (2.0, 12)</td>
<td>2.25 (3.4, 6)</td>
<td>0.43</td>
<td>-0.9</td>
<td>0.78 (1.0, 9)</td>
<td>0.00 (1.5, 8)</td>
</tr>
<tr>
<td>Social activities outside home</td>
<td>1.83 (1.5, 19)</td>
<td>1.06 (0.5, 16)</td>
<td>4.83 (5.5, 12)</td>
<td>3.50 (3.8, 8)</td>
<td>0.83</td>
<td>-3.0</td>
<td>1.11 (1.6, 9)</td>
<td>-0.50 (2.4, 8)</td>
</tr>
<tr>
<td>Quality of social relationships</td>
<td>4.10 (2.6, 20)</td>
<td>4.00 (2.5, 17)</td>
<td>5.75 (2.2, 12)</td>
<td>3.89 (2.6, 9)</td>
<td>0.70</td>
<td>-3.7</td>
<td>4.22 (2.2, 9)</td>
<td>7.00 (10.2, 7)</td>
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**Lower limit of one-sided 95% CI:**