PILOT STUDY

Effects of Self-induced Unclassified Therapeutic Tremors on Quality of Life Among Non-professional Caregivers: A Pilot Study

自诱导未分类治疗性震颤对非专业护理者的生活质量的影响：一项初步研究

Efectos de los temblores autoinducidos no clasificados sobre la calidad de vida en los cuidadores no profesionales: un estudio piloto

David Berceli, PhD, *United States*; Melanie Salmon, MB BCh (Rand), *South Africa*; Robin Bonifas, PhD, MSW, *United States*; Nkem Ndefo, RN, CNM, *United States*

ABSTRACT

Background: Chronic stress has a negative effect on health-related quality of life. In challenging environments with multiple stressors, limited access to mental health resources, and cultural impediments to health care delivery, effective and accessible methods of stress management are critical. Activation of self-induced therapeutic tremors (SUTT) may mitigate excess stress and improve quality of life (QoL) under such conditions.

Objectives: To investigate (1) the feasibility of a 10-week SUTT training and practice intervention and (2) the association between participants' use of SUTT and any changes in their self-reported health-related QoL.

Methods: All staff members of the SOS Children's Village in Cape Town, South Africa (n=21) received 10 weeks of SUTT weekly training and group practice along with independent SUTT practice 2 to 3 times weekly. A wellness-based QoL questionnaire was administered before and after the intervention, and participants were instructed to keep a diary of their experiences.

Results: Following 10 weeks of SUTT instruction and practice (1) there was a 91.3% adherence rate to the intervention protocol and (2) participants reported their overall impressions of changes in all five QoL domains increased at a statistically significant level: mean scores were 3.81 at pre-test and 4.35 at post-test ($P<.05$).

Conclusions: A 10-week SUTT instruction and practice protocol is both highly feasible among non-professional caregivers and a potential therapeutic method for improving QoL.

摘要

背景：慢性应激对身体健康相关的生活质量会产生负面作用。在有多重性的压力、精神卫生资源有限以及对医疗保健服务存在文化障碍的充满挑战的环境中，高效、可利用的压力管理至关重要。在这种情况下，激活自我诱导治疗性震颤（Self-induced therapeutic tremors, SUTT）可缓解过多的压力，并改善生活质（QoL）。

目的：调查研究（1）一个10周SUTT培训和实践的可行性（2）参与者使用SUTT与其自我报告健康相关的生活质量变化之间的关联。

方法：南非开普敦SOS儿童村的所有工作人员（n=21）接受了10周SUTT训练，每周一次SUTT培训和小组练习及2至3次独立SUTT练习。在干预前后，进行了基于健康的生活质量问卷调查，并要求参与者记录下其经历的日记。

结果：10周SUTT教学和练习后，（1）干预方案的依从率为91.3%，（2）参与者报告他们对所有五个QoL领域的整体印象 的增加具有统计学意义：测试前后的平均评分分别为3.81和4.35（P<.05）。

结论：10周SUTT教学和实践研究方案对非专业护理人员和提高生活质量的潜在的治疗方法都是非常可行的。

SINOPSIS

Antecedentes: El estrés crónico tiene un efecto negativo sobre la salud y la calidad de vida En entornos difíciles con múltiples factores de estrés, un acceso limitado a los recursos de salud mental, con obstáculos culturales en cuanto a la prestación de asistencia sanitaria, resulta fundamental saber gestionar de manera efectiva y comprensible el estrés. La activación de temblores autoinducidos (self-induced therapeutic tremors, SUTT) puede ayudar a mitigar el exceso de estrés y a mejorar la calidad de vida en esas condiciones.

Objetivos: Investigar (1) la viabilidad de un periodo de formación y práctica de intervención de 10 semanas SUTT y (2) la asociación entre el uso de los participantes de SUTT y cualquier cambio en su autoevaluación de su calidad de vida relacionada con la salud.

Métodos: Todos los miembros de Aldeas Infantiles SOS de Ciudad del Cabo (Sudáfrica) (n = 21) recibieron 10 semanas de formación SUTT y prácticas en grupo junto con las prácticas independientes de SUTT 2 o 3 veces por semana. Se facilitó un cuestionario sobre la calidad de vida antes y después de la intervención y se enseñó a los participantes a cumplimentar un diario con sus experiencias personales.

Resultados: Después de 10 semanas de formación y prácticas de SUTT (1) se apreció una tasa de cumplimiento de un 91,3 % del protocolo de la intervención y (2) los participantes notificaron sus puntos de vista generales de los cambios en las cinco esferas de calidad de vida, que aumentó significativamente desde un punto de vista estadístico: puntuaciones medias de 3,81 antes del cuestionario y 4,35 después del cuestionario ($P < 0,05$).

Conclusiones: Un protocolo SUTT de formación y práctica de 10 semanas es muy viable entre cuidadores no profesionales y un método terapéutico potencial para mejorar la calidad de vida.

Author Affiliations
Trauma Recovery Services Phoenix, Arizona (Dr Berceli); private practice, Western Cape, South Africa (Ms Salmon); School of Social Work, Arizona State University Phoenix (Dr Bonifas); private practice Los Angeles, California (Ms Ndefo).

Citation
Global Adv Health Med. 2014;3(5):45-48. DOI: 10.7453/gahmj.2014.032

Correspondence
David Berceli, PhD
dave@traumaprevention.com

Disclosures
The authors complete the ICMJE Form for Potential Conflicts of Interest. Dr Berceli disclosed that as the developer of the Tension and Trauma Releasing Exercises described in this study, he will receive royalties on the purchase of books and DVDs that contain the exercise process. The other authors had no conflicts to disclose.

BACKGROUND

Musculoskeletal tremors are a common neurophysiological phenomena experienced before, during, or following stressful events, and as such are termed enhanced physiologic tremors.[1] Yet these tremors are generally perceived as a pathological expression of stress and are included in the diagnostic criteria in a number of psychological illnesses, such as panic attacks, social phobia, generalized anxiety disorder, and post-traumatic stress disorder.[2] The etiology, function, and inherent purpose of these tremors have received scant research attention, especially in relation to their widespread incidence.[3]

Dr David Berceli developed Tension and Trauma Releasing Exercises (TRE), an integrative neurophysiological approach[4,5] that recognizes the homeostatic and thus therapeutic value of this type of tremor in the human body under stress. By using a similar but self-induced tremor to mechanically discharge physical tension, TRE thereby mitigates the experience of excess stress.[6-9] The tremor evoked by TRE remains unclassified per the 1998 consensus statement on tremor developed by the Movement Disorder Society.[1] Proposed nomenclature for the TRE-induced tremor is self-induced unclassified therapeutic tremor (SUTT). While closest to an enhanced physiologic tremor, the SUTT has unique activation conditions, topography, frequency, and amplitude. Fundamentally an action tremor with both postural and isometric activation, the SUTT is augmented at rest, widely distributed, and has variable amplitude and frequency.[4,5] TRE was initially developed for international use in high conflict zones and areas experiencing natural or man-made disasters. Designed as a self-directed somatic modality to be taught in group settings, the TRE technique is easily learned, reproduced, and practiced.[4]

It is widely accepted that chronic stress has a negative impact on health-related QoL.[10] South Africa, in particular, experiences multiple stressors, including high rates of interpersonal violence, poverty, and unemployment, and one of the highest HIV infection prevalence rates globally.[11-13] This is compounded by limited access to mental health programs and treatment, with only nine mental health professionals per 100 000 population.[13] Additionally South Africa is home to a heterogeneous population with numerous ethnic, language, and religious groups.[13] There is a strong need for effective, financially accessible, and cross-culturally adaptive methods of stress reduction.

The study site was a representative NGO social service agency, SOS Children's Village Cape Town, South Africa. This site houses up to 141 abused, orphaned, and/or abandoned children referred by the South African Department of Social Development Children's Court. With only one professional social worker, the care delivery model relies on "House Mothers," who receive 4 months of training and then are responsible for the physical, emotional, and learning needs of up to eight children aged 3 to 17 years, grouped into "Family-Based Care" residential units.

Our objective was to examine (1) the feasibility of a 10-week SUTT training and practice intervention and (2) the association between participants' use of SUTT and any changes in their health-related quality of life as reported via questionnaire.

METHODS

This was a single-armed, non-controlled pilot study conducted with all staff at SOS Children's Village Cape Town in 2012. Participants gave their informed consent in writing after being given comprehensive information. After the first day of training, two of the 23 participants elected to leave the study for personal reasons. The remaining participants (N=21) included one professional, 17 non-professional (ie, "House Mothers"), and three support staff members.

Study participants received theoretical and experiential SUTT instruction in a group setting at weekly intervals for 10 weeks. Training sessions were three and seven hours alternating weekly. Theoretical instruction included lecture and discussion on the anatomy, physiology, and psychology of the stress-trauma continuum. The experiential component involved demonstration and practice of the SUTT movement protocol. This protocol consists of seven discrete exercises performed in a prescribed sequence to induce the SUTT. Exercises that stretch the muscles of the feet, thighs, hips, and lower trunk are alternated with those that mildly fatigue muscles in the lower and upper legs, hips, buttocks, and lower torso. Though the SUTT may activate in any of the exercises, it is characteristically most prominent in the final exercise, which culminates in a passive supine position. Leg extension terminates the movement sequence by extinguishing the SUTT.[4,5] Participants received a total of 20 hours theoretical instruction and 30 hours experiential practice. Participants were also required to independently practice SUTT two to three times each week and keep a simple non-standardized diary of their experience to increase engagement. Due to low literacy, the diaries were mostly incomplete or unused.

We chose the highly reliable Health, Wellness, and QoL Questionnaire (HWQoL) for its broad and coherent wellness focus explicitly reflecting the World Health Organization definition of health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity".[14] The HWQoL is a 55 Likert-scale item inventory across five domains (*physical health*, *mental and emotional health*, *stress evaluation*, *life enjoyment*, *and overall quality of life*).[15] We administered the HWQoL before and after the intervention. Paired-samples *t*-tests were conducted to assess differences across each of the measure's five domains following SUTT instruction and practice. Given the small sample size, an alpha value of .10 was used to determine statistical significance to assure detection of meaningful differences.

RESULTS

Twenty-three individuals enrolled in the study with 21 completing the 10 week intervention period for a retention rate of 91.3%. Twenty-one individuals completed the HWQoL questionnaire, representing 19 women and two men. Ages ranged from 25 to 62 with an average age of 46.6 (SD=9.63). Six different ethnic, language, and/or religious groups were represented among the participants. Only three participants (14.3%) were above the poverty line and had an education level beyond basic literacy (Standard 8). All 17 (81%) of the "House Mothers" had only basic literacy and were below the poverty line.

As depicted in Table 1, the mean score for physical health was 1.98 at pre-test and 2.08 at post-test ($P>.10$); the mean score for mental/emotional health was 2.27 at pre-test and 2.07 at post-test ($P>.10$). These changes were not statistically significant. The mean stress evaluation score at pre-test was 2.48 and at post-test was 2.47; this represents a non-statistically significant change. For *life enjoyment*, participants' mean score increased at a statistically significant level from 2.72 at pre-test to 3.32 at post-test ($P<.05$). Participants made small gains in *overall QoL*. Mean scores increased from 4.67 at pre-test to 4.94 at post-test, but this difference did not achieve statistical significance ($P>.10$).

Table 1 Changes in Health, Wellness, and Quality of Life Responses Following TRE Treatment (n=21)

Domain	Pre-test Mean (SD)	Post-test Mean (SD)	*t*
Physical state	1.98 (.70)	2.08 (.63)	–.587
Mental and emotional state	2.27 (.68)	2.07 (.63)	1.065
Stress evaluation	2.48 (.77)	2.47 (.90)	.048
Life enjoyment	2.72 (1.47)	3.32 (.63)	–2.234[a]
Overall quality of life	4.67 (.83)	4.94 (.83)	–1.682
Overall impressions	3.81 (1.21)	4.35 (.87)	–2.488[a]

[a]$P<.05$

However, their *overall impressions* regarding changes in all five QoL domains (*physical health*, *mental and emotional health*, *stress evaluation*, *life enjoyment*, and *overall QoL*) increased at a statistically significant level: mean scores were 3.81 at pre-test and 4.35 at post-test ($P<.05$). Participants experienced more life satisfaction after incorporating SUTT into their routines on a regular basis, with more frequent positive emotions toward themselves and greater confidence in their ability to deal with adversity.

Since participants did not report statistically significant improvements in *physical state*, *mental/emotional state*, *stress evaluation*, and *overall QoL* via their responses on each subscale but they reported they were doing better in these areas via *overall impressions*, an additional series of *t*-tests[16] were run to assess changes in the individual items related to *overall impressions*. Results are depicted in Table 2 and indicate that after SUTT treatment, participants report doing better at a statistically significant level in three areas: mental/emotional state, life enjoyment, and overall QoL. Mean scores related to mental/emotional state increased from 2.22 to 2.56 ($P<.10$); mean scores related to life enjoyment increased from 2.28 to 2.67 ($P<.05$); mean scores related to overall QoL increased from 2.28 to 2.61 ($P<.10$).

Table 2 Changes in Overall Impressions Related to Health, Wellness, and Quality of Life Following TRE Treatment (n = 21)

	Mean pre-test (SD)	Mean post-test (SD)	*t*
Overall impression physical well-being	2.28 (.89)	2.50 (.71)	–1.288
Overall impression mental and emotional state	2.22 (.81)	2.56 (.62)	–2.062[a]
Overall impression ability to handle stress	2.39 (.85)	2.72 (.67)	–1.558
Overall impression enjoyment of life	2.28 (.83)	2.67 (.48)	–2.122[b]
Overall impression quality of life	2.28 (.83)	2.61 (.61)	–1.844[a]

[a]$P<.10$; [b]$P<.05$
Abbreviation: TRE, Tension and Trauma Releasing Exercises.

LIMITATIONS

The attempted collection of qualitative data was hindered by participants' low English literacy, which rendered the unstructured diaries unusable for analysis. However, the reliance on a single quantitative measure may have been offset by the high number of items in the HWQoL inventory across multiple domains. Given that this was a pilot study with a small sample size, there is a possibility that a larger sample could yield differing results. The fact that such statistically significant results were achieved with such a small sample suggest that the impact of SUTT may be quite significant and that a controlled trial with larger numbers of participants and multiple measures is clearly warranted.

CONCLUSION

This is the first published study to examine the feasibility of a SUTT training and practice protocol and the effects of repeated activation of SUTT on QoL. In spite of the challenges of a chronically stressed, multiethnic, and low-literacy study population, a 10-week intervention of SUTT instruction and practice proved feasible among non-professional caregivers with no negative outcomes reported. Staff responded very favorably to the SUTT protocol with a retention rate of 91.3%. Statistically significant QoL gains were observed in the *Life Enjoyment* domain ($P<.05$) and for *Overall Impressions* in all five domains of the HWQoL questionnaire. As participants incorporated SUTT into their routines on a regular basis, they reported more frequent positive emotions toward themselves and greater confidence in their ability to deal with adversity. At the study conclusion, the participants requested that SUTT be offered to the children housed at the study site

facility, further documenting the high acceptability of SUTT treatment. Results suggest that the systematic and repeated activation of the self-induced uncharacterized tremor mechanism holds promising therapeutic value. The increase of movement in a positive direction suggests that these uncharacterized tremors might be a natural neurophysiological response to mitigate excess stress.

REFERENCES

1. Deuschl G, Bain P, Brin M; Ad Hoc Scientific Committee. Consensus statement of the Movement Disorder Society on tremor. Mov Disord. 1998;13 Suppl 3:2-23.
2. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 5th ed. Arlington,VA: American Psychiatric Publishing; 2013.
3. Milanov I. Clinical and electromyographic characteristics of tremor in patients with generalized anxiety disorder. Electromyogr Clin Neurophysiol. 2007;47(1):3-9.
4. Berceli D. Trauma releasing exercises: a revolutionary new method for stress/trauma recovery. Charleston, S.C: Create Space Publishers; 2005.
5. Berceli D. The revolutionary trauma release process: transcend your toughest times. Vancouver, Canada: Namaste Publishers; 2008.
6. Berceli D. Evaluating the effects of stress reduction exercises employing mild tremors: a pilot study [dissertation]. Phoenix, AZ: Arizona State University; 2009.
7. Libretto S, Walter J. Final report: evaluation of Warrior Optimization System (WAROPS) training; March 30, 2012.
8. Johnson S. Interventions for stress and burnout of secondary school educators in high-risk schools. In: Robert M, editor. Abstracts of the 30th International Congress of Psychology; 2012 Jul 22-27; Cape Town, South Africa. Oxon, UK: Psychology Press; 2012:167.
9. McCann T. An evaluation of the effects of a training programme in trauma release exercises on quality of life [master's thesis]. Cape Town, South Africa: University of Cape Town; 2011.
10. Juster RP, McEwan BS, Lupien SJ. Allostatic load biomarkers of chronic stress and impact on health and cognition. Neurosci Biobehav Rev. 2010;35:2-16.
11. Chawla S. 2011 Global study on homicide. United Nations Office on Drugs and Crime. Vienna; 2011.
12. Organization of Economic Co-operation and Development. Country statistical profile: South Africa. In Country statistical profiles: Key tables from OECD. 2013. http://www.oecd-ilibrary.org/economics/country-statistical-profile-south-africa-2013-2_csp-zaf-table-2013-2-en. Accessed July 28, 2014.
13. World Health Organization, Department of Psychiatry and Mental Health, University of Cape Town. WHO-AIMS report on mental health system in South Africa. Cape Town, South Africa; 2007.
14. World Health Organization. Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19-22 June, 1946; signed on 22 July 1946 by the representatives of 61 States (Official Records of the World Health Organization, no. 2, p. 100) and entered into force on 7 April 1948.
15. Blanks R, Schuster T, Dobson M. A retrospective assessment of Network Care using a survey of self-rated health, wellness and quality of life. http://dreamercenter.co.il/wp-content/uploads/A-Retrospective-Assessment-of-Network-Care.pdf. Accessed July 28, 2014.
16. Osborn J. Notes on the use of data transformations. Practical Assessment, Research and Evaluation. http://PAREonline.net/getvn.asp?v=8&n=6. Accessed July 28, 2014.