Adaptation and implementation of an evidence-based behavioral medicine program in diverse global settings: The Williams LifeSkills experience

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Abstract

Epidemiological research has documented the health-damaging effects of psychosocial factors like hostility, depression, anxiety, job stress, social isolation and low socioeconomic status. Several studies suggest that behavioral interventions can reduce levels of these psychosocial factors. Herein we describe the translational process whereby the Williams LifeSkills® (WLS®) program and products for reducing psychosocial risk factors have been developed and tested in clinical trials in the U.S. and Canada and then adapted for other cultures and tested in clinical trials in other countries around the world. Evidence from published controlled and observational trials of WLS® products in the U.S. and elsewhere shows that persons receiving coping skills training using WLS® products have consistently reported reduced levels of psychosocial risk factors. In two controlled trials, one for caregivers of a relative with Alzheimer's Disease in the U.S. and one for coronary bypass surgery patients in Singapore, WLS® training also produced clinically significant blood pressure reductions. In conclusion, WLS® products have been shown in controlled and observational trials to produce reduced levels of both psychosocial and cardiovascular stress indices. Ongoing research has the potential to show that WLS® products can be an effective vehicle for the delivery of stress reduction and mental health services in developing countries.

Keywords

Behavioral interventions, Psychosocial stress factors, Biological mechanisms, Williams LifeSkills, Translational research

INTRODUCTION

Recognition of the pathogenic effects of psychosocial risk factors began to grow in the early 1980s, when hostility was identified as the toxic component of the type A behavior pattern responsible for increased coronary heart disease risk and also all-cause mortality [1–3]. Appreciation of the importance of psychosocial risk factors mounted with the demonstration in the 1990s that depression [4–6], work stress [7], and low socioeconomic status and

Implications

Practice: WLS® products have been shown in controlled and observational trials to produce reduced levels of both psychosocial and cardiovascular stress indices in diverse global settings.

Policy: If these benefits, as well as improvements in clinical outcomes, are confirmed in further phase II and III trials, these and similar products could be incorporated into programs to improve prevention and treatment of physical and mental disorder in diverse global settings.

Research: Research needs to be directed toward phase II trials to replicate these benefits and document further that these and similar products also improve clinical outcomes. Phase III trials will then be in order to demonstrate similar benefits in real-world settings.

social support [8] are also associated with increased disease risk and poor prognosis once disease is present. More recently, the INTERHEART Study evaluated the impact of both physical and psychosocial factors on myocardial infarction (MI) risk in a study 15,152 cases of first MI and 14,821 age/sex-matched controls in 52 countries and found that, independently of physical risk factors, a substantial proportion (33% vs 49.2% for lipids, 35.7% for smoking, and 17.9% for hypertension) of the population attributable risk of MI was associated with an index of psychosocial stress-comprising indices: stress at work and home; financial stress; major life events in the past year; and presence of depression [9, 10]. These psychosocial risk factors do not occur in isolation from one another, but tend to cluster in the same individuals. Working women who report high job strain, for example, also exhibit increased levels of hostility, anger, depression, and anxiety as well as lower levels of social support [11].

The behavioral and biological mechanisms that mediate these effects of psychosocial risk factors on disease risk and mortality remain to be conclusively demonstrated, but persons with higher levels of these risk factors have been found to exhibit a wide range of behaviors and biological characteristics

that are likely to be playing a causal role, including increased health risk behaviors [12], larger cardiovascular (CV) and neuroendocrine responses to acute stressors in both lab and real-life situations [13, 14], reduced parasympathetic function [15, 16], increased platelet activation [17], and increased expression of components of the metabolic syndrome [18, 19]. Direct evidence for the pathogenic effects of increased CV responses to stress comes from prospective studies showing that increased CV response to stress predicts increased stroke incidence [20], increased incidence of hypertension [21], and increased levels of coronary artery calcification [22], a preclinical index of coronary atherosclerosis.

It is not surprising, considering the foregoing, that there has emerged a parallel effort to develop behavioral interventions that reduce levels of these psychosocial risk factors and, hopefully, their impact on disease risk. Initial clinical trials of group-based cognitive behavioral interventions showed a promise in improving prognosis in coronary heart disease [23, 24] and cancer [25], and also in reducing cost in patients with chronic disease [26].

Development of the Williams LifeSkills® program and products

Based on the research reviewed above documenting pathogenic effects of psychosocial risk factors and the initial promising outcomes in these early trials evaluating cognitive behavioral group interventions, we began work in the late 1980s on the *translational* task of developing and testing a cognitive behavioral intervention aimed at reducing levels of both these psychosocial risk factors and the accompanying biobehavioral characteristics that mediate the impact of these factors on the development and/or course of disease. In developing this program, to which we eventually gave the name Williams LifeSkills® (WLS®), we drew from several sources, including the intervention research described above as well as principles of cognitive behavior therapy and behavior therapy. We also drew upon Redford Williams’ research on psychosocial risk factors and clinical experience in developing the Biofeedback Clinic at Duke, and Virginia Williams’ experience in curric-

ulum design as well as her research on the influence of major historic events (World War I) on artistic, cultural, and philosophical trends.

As described in our three books intended for the lay public [27–29] from 1993 to 2006, we derived a set of ten skills designed to reduce negative psychosocial factors like hostility/anger, depression, anxiety and perceived stress and to increase positive factors like self-esteem, optimism and satisfaction with life. Another goal for the skill set we developed was to enable people to increase the amount and quality of social support they derived from their interactions with others. The first six skills (Table 1) are for “damage control”—something distressing has happened and you need to be *aware* of the objective facts of that situation and your thoughts and feelings so that you can *evaluate* them objectively and make a rational decision whether this is one of those situations where you need to *change your reaction* or one where you need to take effective action—*problem solving, assertion* or *saying no*—to change the situation so that you, or others you care about, are not mistreated. The last four skills serve the purpose of “damage prevention.” By *speaking so others listen, listening well, empathizing* to understand others and *increasing the positives* in your encounters with others and increasing *meaning* in your life, you decrease the likelihood that these encounters become sources of distress and make it more likely you will increase your sense of feeling supported by others.

In designing and promulgating the WLS® program, we were also guided by Russell Glasgow’s original *RE-AIM* principles [30]. According to these principles, to have a significant public health impact, an intervention like WLS® must have *Reach*—i.e., it must be deliverable to large numbers of people. To accomplish this, we initially designed the program for delivery in group settings, which also had the advantage of enabling participants to learn from each other and gain mutual social support. To expand the reach of our program even more, we obtained a Small Business Innovative Research grant from the NIMH to develop and test a version of the WLS® program that could be delivered via video, and we eventually adapted the video version for online internet delivery.

Table 1 | The ten LifeSkills modules presented in the VCS

1. Increasing objectivity and awareness of thoughts and feelings in a distressing situation
2. Evaluating that situation to decide whether to try to change one’s reactions or to take actions to try to change the situation
3. Changing one’s reaction to distressing situations
4. Problem solving to change distressing situations
5. Using assertion to increase the chance that others will behave as you’d like
6. Saying No to reduce exposure to distressing situations
7. Speaking so others really listen
8. Becoming a better listener
9. Empathizing to understand others
10. Increasing the positives in your encounters with others and the sense of meaning in your life

According to RE-AIM principles, effective programs must be shown to have *Efficacy* in reducing risk factors documented in rigorous, randomized controlled trials, as well as demonstrate *Effectiveness* in achieving similar benefits in real-world settings. Following this principle, we have conducted—and collaborated with others around the world in—numerous clinical trials in both research and real-world settings that documented the efficacy and effectiveness of the WLS[®] program in its various formats.

Even with documented efficacy and effectiveness, to be successful in impacting public health, programs like ours must also be *Adopted*—or *bought*—by decision makers in a broad range of settings where the intervention might be used. Our strategy for applying this principle was twofold. First and most important, of course, was to do the research that would provide the evidence base documenting the efficacy/effectiveness of WLS[®] programs. We felt it was also very important to *market* our programs well. Accordingly, in 1996 we founded a commercial company, Williams LifeSkills, Inc. whose business plan was to design, test and market behavioral interventions that reduce psychosocial risk factors and thereby reduce disease risk while improving health and well-being. We have been, and continue to be actively engaged in marketing WLS[®] programs to both the general public and to decision makers in government, health insurance and disease management companies and large corporate entities. We see this commercialization as the critical final step in translating the research documenting the health-damaging effects of psychosocial risk factors and the potential of behavioral interventions to ameliorate those effects into commercial behavioral products—analogue to the pharmaceutical industry’s drug products—that can be widely distributed—by a new “behaviorceutical” industry?—to prevent disease and improve the health of masses of people around the world.

Even if adopted (bought), behavioral products like WLS[®] will not achieve such an ambitious goal unless used—*Implemented*—in real-world settings. Our strategy to achieve this aim has been to develop the WLS[®] programs—e.g., using video and online deliveries and adaptations for specific target groups or cultures—into products that can easily be delivered in a broad range of settings and populations. We have also framed the WLS[®] program as one that *trains* people to use coping skills that will increase resiliency and create resistance to the health-damaging effects of stress, rather than focusing on the person as broken and in need of fixing by application of “therapy.” We believe this positive framing will reduce feelings of stigma that could prevent many, especially those with a medical illness who do not think (or want to think) of themselves as mentally ill, from learning and using the skills. Lastly, to ensure that WLS[®] programs will be implemented, we have limited training to a fixed

number of sessions (or video/online modules), in which each of the ten skills is presented in a manualized, protocol-driven format that enables each trainee (rather than “patient”) to learn to practice and apply the skill to actual problems and situations currently being encountered at work, home, or play.

And finally, the public health impact of behavioral products like ours will not be achieved if the improvements in risk factors, biobehavioral mechanisms and health are not *Maintained*. To document maintenance, we have included follow-up assessments of participants in both controlled and observational trials of WLS[®] products conducted by Williams LifeSkills, Inc., or research partners around the world.

The evidence base for efficacy/effectiveness of WLS[®] products in the USA and Canada

As outlined in Table 2, controlled clinical trials have provided evidence for the efficacy of WLS[®] products. The first study to document benefits of an early version—based on *Anger Kills* [27]—of the WLS[®] workshop was a small randomized controlled trial (RCT) in males following a heart attack by Gidron et al. [31] that found hostility after the end of training as assessed by both structured interview and questionnaire and diastolic blood pressure to be reduced significantly more in patients in the active arm than those randomized to usual care. Both these improvements were maintained or enhanced at follow-up 2 months later. Because this study was done in Canada, it was possible to do a follow-up assessment of the clinical course over the 6 months post-training. Compared with usual care, men in the active arm showed significant reductions in both hospital stay and medical care costs over the 6 months follow-up [32]. Another RCT evaluating benefits of the WLS[®] video found significantly larger reductions in both trait-anxiety and perceived stress among the active arm participants compared with those randomized to usual care, both two weeks after the end of training and after 6 months follow-up [33]. In an RCT evaluating, the WLS[®] workshop augmented by the WLS[®] video, hypertensive employees of a large urban medical center who were randomized to WLS[®] training showed significantly larger, clinically significant decreases in systolic blood pressure compared with those receiving usual care according to JNC-6/7 guidelines [34]. And lastly, in a controlled (alternating assignment to active vs wait-list arms), clinical trial of the WLS[®] Video adapted for use by caregivers of a relative with Alzheimer’s disease, those in the WLS[®] caregiver video arm, who also received weekly telephone coaching calls, showed significantly larger decreases in depressive symptoms, trait-anxiety, perceived stress and systolic and diastolic blood pressure that were maintained or enhanced at 6 months follow-up [35]. In addition to replicating

Table 2 | Williams LifeSkills clinical trials in the USA and Canada

Study author	Type of intervention	Study design	Study group characteristics	Follow-up length	Outcomes (active arm (s) vs control) at $P<0.05$	Effect size (d) in active arm
Gidron et al. [31]	Early version of WLS® Workshop Over 8 weeks	RCT Workshop Or usual care	22 male CHD Patients with high hostility Age, 54±7	2 months	↓Hostility SI-assessed Cook–Medley Ho scale ↓DBP	0.93 0.61 0.92
Kirby et al. [33]	WLS® workshop (W), video (V), or W+V over 4 weeks	RCT with 3 active arms vs wait-list control	Distressed volunteers, 47; men, 149; women, 49%; Caucasian, 32%; African American, 19%; others, age 40±13	6 months	Over 6 mos F/U V and W+V → ↓T-Anx ↓PSS	Not reported
Clemow et al. [34]	WLS® workshop and video	RCT workshop and video vs usual care, JNC-6/7 guidelines	90 hypertensive employees of large urban medical center; age, 49±9; 16% W/NHisp 16% W/Hispanic 46% B/NHisp 9% B/Hispanic 13% Other	3 months	In workshop SBP149→139 mmHg vs 147→146 mmHg in usual care	0.57
Williams et al. [35]	WLS® video adapted for caregivers of relative with Alzheimer’s disease	Controlled clinical trial with alternating assignment to video or wait-list groups	116 caregivers; 64% Caucasian and 36% African American (age, 61±13)	6 months	Video group vs wait-list had larger ↓CES-D, ↓T-Anx, ↓PSS ↓SBP ↓DBP	0.63 0.64 0.90 0.40 0.42
Campo et al. [36]	WLS® workshop over 2 days	Observational trial with comparison group 1 year later	2nd year medical school class, 2 successive years	2 weeks after end of 2-day training	WLS® class showed ↓hostility and ↓use of placating or avoidant responses in difficult pt scenarios	Not reported
Williams et al. [37]	WLS® workshop over 2 days	Observational trial, employees of a corporate client	110 employees 77% Caucasian 23% African American 66% women 80% clerical 20% Supv Age, 44±8	6 months	End of training ↓CES-D ↓Hostility ↓S-Anx ↓T-Anx ↑SocSup After 6 months ↓CES-D ↓Hostility ↓S-Anx ↓T-Anx	1.19 1.23 1.17 1.49 0.79 0.77 1.19 0.71 1.31

Note: SI structured interview, CES-D Center for Epidemiological Studies Depression Scale, S-Anx, T-Anx: Spielberger State-Trait Anxiety Inventory, SocSup Interpersonal Support Evaluation List (ISEL), PSS Perceived Stress Scale. Effect sizes are based on analyses that covaried baseline levels of variables that differed significantly between treatment and control groups at baseline

findings of psychosocial improvement following WLS® training, this study extends the demonstration of benefits to include a potential biological mechanism whereby stress damages health—higher blood pressure.

Evidence for the effectiveness of WLS® products in real-world settings comes from two observational trials. In one, done by Campo et al. [36], second-year medical students who participated in the WLS® workshop over a 2-day period showed significant reductions in hostility and in the use of placating and avoidant responses in difficult patient scenarios following the training. In contrast, a comparison group of second-year students the following year who did not receive WLS® training showed slight increases in both hostility and placating and avoidant responses. In an observational trial of the WLS® workshop among employees of one of our corporate clients, at the end of training there were significant decreases in depressive symptoms and state and trait anxiety and increased social support; except for social support, all these improvements were maintained or enhanced at follow-up 6 months later [37]. Where available, effect sizes of the psychosocial and blood pressure improvements in these controlled trials were moderate to large.

Adaptation of WLS® programs for use on a global scale

Based on the encouraging results in the controlled and observational trials in the USA and Canada as reviewed above, we began in the early 2000s to collaborate with colleagues in other countries to adapt the WLS® workshop for use in those cultures and to determine whether the benefits observed in the USA and Canadian trials could be replicated on a global scale. The adaptation process began with the training of a cadre of workshop facilitators in the other country. In the USA—based on the principle that in order to teach others to use a skill, one must first learn how to use it him/herself—this training consists—the facilitator trainees participate in the workshop themselves over a 2-day period. This is followed by three and sometimes more days of practice supervision in facilitating the ten skills among each other. A similar approach is used to adapt the presentation of the ten skills in the new culture, with a cadre of facilitator trainees taking the workshop over a 2-day period. While initial consultations and modifications have occurred beforehand, this process is greatly enhanced when the potential trainees begin actual training. Because the first skill uses log keeping in which participants write down the *objectively observable facts* in situations in which they experience distress, followed by writing down the thoughts and feelings they experienced, it is possible to use the specific sorts of distressing situations to guide adaptation of the presentation of the skills for each culture. In the process of collecting log entries of distressing situations com-

mon to the culture of the trainees, it was possible to identify the range of situations that persons in that culture would need to be able to handle. For example, in Singapore with its strong Chinese cultural tradition, a common distressing situation that emerged among young married women who were also holding down a job was the expectation on the part of their mother-in-law that they would come over once a week to help the mother-in-law with her housework. This arrangement had been in place in Chinese culture for centuries but does not work so well in modern Singapore, where it has become common for young mothers to work outside the home. If trainees work with a specific population such as heart patients, their extensive knowledge of the population they serve further enhances adaptation.

As shown in the “I AM WORTH IT™” Roadmap in the upper left corner of Fig. 1, the second skill is to evaluate one’s thoughts and feelings about the distressing situation by asking four questions: Is this situation *Important* enough to warrant my continuing attention? Are my thoughts and feelings *Appropriate* to the objective facts? Is the situation that is distressing me *Modifiable* (or if I’m not sure, ought it be)? And, when I consider myself and the others involved, would it be *WORTH IT* to take the actions necessary to change the situation? Also shown in the other corners of Fig. 1 are versions of this same Roadmap in Mandarin, Portuguese and Hungarian. If the trainee gets a “No” to any of these questions, he/she needs to practice Deflection Skills to change the thoughts and feelings being experienced. Four “Yesses” indicates that one needs to take action. In the example of our young Singaporean mother, if one did not know the Chinese culture, the appropriate action strategy would be Assertion, to describe to mother-in-law the behavior (asking me to come over once per week to help with housework) that is causing the distress, describe the feelings being experienced (frustration, anxiety, fear of rejection), and then make a specific request (would it be alright if I did not come over every week?) As we went through the 3 days of supervision in teaching the skills, however, the facilitator trainees made it very clear that no young Chinese woman is going to feel comfortable making assertive statements to her mother-in-law—there would be too much risk of someone losing face. It would be acceptable, on the other hand, to ask a third party—e.g., auntie—to practice assertion with the mother-in-law on behalf of the daughter-in-law. If the daughter-in-law were to do direct assertion with the mother-in-law, this would be seen as being out of place and the mother-in-law would lose face because of the daughter-in-law’s direct confrontation (i.e., daughter-in-law would not be showing sufficient respect). On the other hand, when auntie brings up the topic with mother-in-law directly, she can still show sufficient respect while raising the delicate issue. Also, if mother-in-law remonstrates about daughter-in-law,

A 4 Kérdés Technika útmutató

A negatív gondolatok, érzések, és a megoldási lehetőségek értékelése. A Helyzet leírása - Mik az objektív tények?

Dia 4.1: A 4 Kérdés Technika

Fig. 1 | The “I AM WORTH IT” Roadmap in English (upper left), Mandarin (upper right), Portuguese (lower left) and Hungarian (lower right)

daughter-in-law is not there to hear it and auntie can defuse the situation. Another example of a cultural adaptation that was necessary in Far East cultures came when working on the Listening skill. In contrast to the West, where eye contact conveys interest, in the Far East, continuing eye contact would be experienced as an invasion of space and would not be conducive to effective listening.

It is worth noting at this point that, once the cultural adaptations had been implemented in the WLS[®] workshop, we found it important to carry out a few trial workshops with persons in that culture who would be typical participants. Prior to doing such trial workshops, we were warned by persons familiar with Singaporean Chinese culture that “You will never get Chinese to talk about their feelings in the presence of other people!” We and those who warned us of this potential problem were surprised when Chinese in the trial workshops were quite openly expressive in reporting their feelings. In retrospect, we realized that by having the I AM WORTH IT[™] Roadmap, the consequent action skills—problem solving, assertion and saying no—to change the distressing situations, and often the use of an intermediary so no one loses face, the Chinese participants were no longer so hesitant in expressing their feelings.

All well and good, you say, but will this adapted WLS[®] workshop “work” in the Singaporean Chinese culture as it did in the USA and Canada? The answer to this question was a clear “yes” as

documented in the findings in the RCT that Bishop et al. (Table 3) [38] conducted in a sample of 59 male Singaporean (60% Chinese) patients following coronary bypass surgery. Not only were there robust improvements with regard to both negative and positive psychosocial risk factors, but blood pressure and heart rate at both rest and in response to anger recall were significantly decreased in the men randomized to WLS[®] workshop training, with all improvements maintained or enhanced at 3 months follow-up. Effect sizes for these psychosocial and cardiovascular improvements in the WLS[®] workshop arm were moderate to large. Dr. Bishop and colleagues at the National University of Singapore are currently conducting further RCTs of the WLS[®] workshop among other CHD patient groups.

In Hungary, in an observational trial of the WLS[®] workshop, adapted as described above for delivery there, Stauder et al. [39] found that distressed persons in the Budapest metro area who participated in the workshop showed a pattern of psychosocial improvements that are remarkably similar to those observed by Bishop et al. [38] on the other side of the world. Effect sizes in Hungary were similarly moderate to large. Dr. Stauder and colleagues at Semmelweis University in Budapest are now conducting additional Hungarian RCTs of the WLS[®] workshop in workplace settings.

In addition to these published trials in Singapore and Hungary, we have collaborated with colleagues in China, Germany and Brazil to train WLS[®]

Table 3 | Williams LifeSkills published clinical trials outside USA and Canada

Study author location	Type of intervention	Study design	Study group characteristics	Follow-up length	Outcomes (active arm(s) vs control) at <i>P</i> ≤0.05	Effect size (d) in active arm	
Bishop et al. [38] Singapore	WLS® workshop 6 sessions over 6 weeks	RCT WLS® workshop vs usual care plus 1-h lecture on stress	58 male CHD patients following coronary bypass surgery 60% Chinese 26% Indian 7% Malay 7% Other Age, 54±7.5	3 months	↓CES-D	0.71	
					↓T-Anger	0.82	
					↓PSS	0.56	
					↑Satisfaction w. Soc. Sup.	0.56	
					↑Satisfaction w. life	0.57	
Stauder et al. [39] Hungary	WLS® workshop 12 h over several weeks	Observational trial	107 distressed volunteers in Budapest metro area (age, 37±13) with 81% female	Pre-post-training and 5 months F/U in 42	↓SBP Reactivity	Mean for BP and HR reactivity=0.97	
					↓HR Reactivity		
					Pre-post-training		
					↓PSS		0.76
					↓T-Anxiety		0.42
					↓BDI		0.40
					↓Somatic Sx		0.34
					↑Well-being		-0.61
					↑Life satisfaction		0.35
					At 5-month F/U all improvements maintained except Life Satisfaction		

Note: *CES-D* Center for Epidemiological Studies Depression Scale, *T-Anger* Spielberger State-Trait Anger Expression Inventory, *PSS* Perceived Stress Scale, *Satisfaction with Soc. Sup* Short-Form Social Support Questionnaire, *Satisfaction with Life* Diener Satisfaction with Life Scale, *T-Anxiety* Spielberger State-Trait Anxiety Inventory, *BDI* Beck Depression Inventory, *Somatic Sx* PHQ-15, *well-being* WHO Well-being Questionnaire, *Satisfaction with Life* single question ten-point Likert's scale

Table 4 | Williams LifeSkills clinical trials in progress outside USA and Canada

Study leader location	Type of intervention	Study design	Study group characteristics	Follow-up length	Outcomes (active arm (s) vs control) at $P<0.05$
Wang Xiaoping China	WLS® workshop over 8 weeks	RCT workshop vs no treatment control	73 8th-year medical students 30 males 43 females	Post-training	<i>Preliminary results in active Arm→</i> ↓Anxiety ↓Depression ↓Negative coping ↑Positive coping ↑Communication skills ↑Social support ↑Self-esteem
Wang Xiaoping China	WLS® workshop adapted for incarcerated youthful violent offenders	RCT, workshop in certain prisons vs no intervention in others	Male and female youthful violent offenders incarcerated in prisons around China	6 months for psychosocial factors; 2–3 years for recidivism	Psychosocial factors and repeat criminal offenses
Christian Albus Germany	WLS® workshop sessions 2/ week over 3 months	RCT, workshop is one component of a multiple risk factor primary prevention trial	400 employees of a large corporation with increased CVD risk factors	2–6 months for psychosocial factors; 2–5 years for CVD clinical events	Psychosocial factors and CVC clinical events
Alexandre Ghelman Brazil	WLS® workshop with online support sessions 1/month with online support	Observational trial	130 employees of large corporation	1 year	Psychosocial factors; preliminary process assessment → high rates of participation and satisfaction being decided
Adrienne Stauder Hungary	WLS® workshops	RCT in worksites	>300	1 year	Workplace stress levels

Note: *Anxiety and Depression Self-Rating Anxiety and Depression Scales, Negative and Positive Coping Trait Coping Style Questionnaire, Social Support, Interpersonal Support Evaluation List (ISEL), Self-Esteem Self-Esteem Scale*

workshop facilitators in those countries to deliver the WLS® workshop in both clinical trials and commercial applications that are currently in progress. As shown in Table 4, with Dr. Wang Xiaoping at Central South University Medical School in Changsha, Hunan, China, we trained WLS® workshop facilitators who will conduct a government-sponsored trial for male youthful violent offenders in multiple correctional institutions across central China to determine whether WLS® training acutely reduces psychosocial risk factor levels, and recidivism over several years following release. Dr. Wang and colleagues have also done a RCT to evaluate effects of WLS® training on eighth-year medical students. Preliminary analyses (reported here with permission of Dr. Wang) show improvements that replicate and extend the findings of Campo et al. [36] among second-year medical students in Miami, FL, USA.

We have also collaborated with Dr. Christian Albus in Germany to mount a RCT evaluating the WLS® workshop as a component of a multiple risk factor intervention trial for employees of a large German corporation. A similar collaboration with Dr. Alexandre Ghelman in Brazil is currently being implemented in an observational trial of the effects of the WLS® workshop with online support among employees of a large Brazilian corporation. Dr. Ghelman informs us that preliminary process assessment has found high rates of participation and satisfaction.

SUMMARY AND FUTURE DIRECTIONS

Several published clinical trials in the USA and elsewhere, both controlled and observational, have shown that training using WLS® products produces statistically and clinically significant improvements in negative and positive psychosocial risk factors as well as cardiovascular function at rest and during mental stress testing. These benefits have been documented in diverse settings including the USA, Canada, Singapore, China, and Hungary. Ongoing trials will provide the opportunity for replication and extension of these benefits on a global scale. If these ongoing trials are successful, there will be a possibility that WLS® products could be a means of delivering stress-coping-skills training in countries that do not have an extensive infrastructure for providing such training, yet have large populations at risk who could benefit.

To cite one example, a recent epidemiological survey [40] based on a sampling frame of 113 million individuals aged 18 or older that included 12% of the adult population of China found that the adjusted 1-month prevalence of a mental disorder was 17.5%, with a 6% prevalence of major depressive disorder. Several obstacles to addressing these needs have been identified [40]. They include the small numbers of mental health professionals in China, reluctance of general physicians and pri-

mary-care health workers to treat mental illness and stigma attached to being mentally ill. If our ongoing collaboration with Dr. Wang is successful showing that WLS® programs can be an effective means of reducing depressive symptoms in ways that do not stigmatize those receiving the “training,” it is possible to envision (some would say fantacize) a time when a newly trained large cadre of WLS® facilitators would be engaged in meeting pressing public health needs in China and elsewhere.

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