

An Innovative Model of Culturally Tailored Health Promotion Groups for Cambodian Survivors of Torture

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Abstract

Cambodians living in the U.S.A. suffer from depression, posttraumatic stress disorder (PTSD), and chronic medical disease at rates far in excess of national averages. The Harvard Program in Refugee Trauma's Cambodian Health Promotion Program seeks to address this burden of disease by offering them culturally tailored health education in a group setting.

A health professional and a bicultural health educator co-facilitated a five-session health promotion group for Cambodian survivors of torture from 2007 to 2011. The program covered five major topics from Western and Cambodian worldviews. They included the meaning of health promotion, nutrition, exercise, stress management and sleep hygiene, and health practitioner-patient communication. The bicultural worker administered Pre and Post semi-structured Health Promotion Questionnaires. The data presented here are the results from 126 participants.

Changes between the Pre and Post health promotion groups demonstrated significant improvements in health status, lifestyle activities, sleep, and depression. Participants revealed greater confidence in communicat-

ing with their primary health care practitioner.

Culturally tailored Cambodian health promotion education administered in a small group setting may improve health and mental health behaviors.

Culturally tailored health promotion education in a small group setting may promote healing in survivors of torture. It is an intervention worthy of further research and development.

Key words: Torture survivor; treatment; Cambodian; health literacy; prevention

Background

Numerous scientific studies reveal that traumatic life experiences are associated with serious psychiatric and medical problems in mainstream populations.¹⁻⁴ For example, a study of adult health insurance carriers found a strong graded relationship between the breadth of exposure to abuse or household dysfunction during childhood and risk for alcohol and drug abuse, depression, and suicide attempt, as well as heart disease, lung disease, liver disease, cancer, and skeletal fractures.⁵

Increased health risks have likewise been associated with communities that have experienced acts of extreme violence, such as torture. For example, Holocaust survivors have been found to be at increased risk of depression and anxiety disorders, cancer, and

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osteoporosis.⁶⁻⁸ They are also at increased risk for cardiometabolic disease, which includes the diseases of hypertension, diabetes, high cholesterol, atherosclerotic heart disease, and vascular dementia.⁸

Like Holocaust survivors, Cambodian survivors of torture have survived extreme violence and suffer from high levels of psychiatric illness. Marshall et al.'s community survey of Cambodians who have resettled in California, conducted between 2003 and 2005, found: "99% of individuals reported near-death due to starvation, 96% reported forced labor (like animal or slave), 90% reported having a family member or friend murdered, and 54% reported having been tortured." They also found high rates of past-year PTSD (62%) and major depression (51%).⁹ Eighty-nine percent of the Cambodians in this study rated their health as either fair or poor. This rate was approximately twice that found in a demographically matched Asian American and Pacific Islanders (AAPI) sample, and more than four times higher than that found in the general California population.¹⁰ Poor self-rated health is of serious concern, because it has been shown to be a more robust predictor of mortality than physician-assessed health.¹¹ Cambodians also reported significantly worse physical functioning than the demographically matched AAPI sample and the general California adult population.¹⁰

Further research has shown that Cambodians in the US who develop these diseases suffer from higher rates of complications than other Americans. In Lowell, Massachusetts, Cambodian-born adults aged 45 years or older had higher death rates from stroke (15.9%) and diabetes (13.4%) compared with all Massachusetts adults in this age group (i.e., 6.5% for stroke, and 2.5% for diabetes, respectively).¹²

Other studies of Cambodians also provide growing evidence of the link between trauma and chronic medical and psychiatric symptoms and disorders. Cambodian survivors of the Pol Pot genocide appear to have worse health than Cambodians who did not experience genocide.¹³ A 1990 survey of Cambodian refugees in the Thai refugee camps found a dose-effect relationship between cumulative trauma and the symptoms of PTSD and depression.¹⁴ Cambodian elders in the United States have been shown to have higher levels of social and physical disability, and greater impairment in activities of daily living, as compared to non-Hispanic Whites, Laotians, and Vietnamese.¹⁵ Cambodian psychiatric patients are significantly affected by diabetes and hypertension¹⁶; and somatic symptoms and cultural syndromes¹⁷. The Cambodians' experience of food deprivation may also contribute to their risk for becoming overweight.¹⁸ In addition, Cambodians' smaller body habitus puts them at increased risk for diabetes at a body mass index (BMI) of 23 or more, as compared to non-Asians who are at increased risk for diabetes at a BMI of 25 or more.¹⁹

The earliest Cambodian health education program in the U.S. was a program for women and children in San Diego, California from 1992 - 1994. A case study on this program highlighted the complex cultural factors in Cambodian health, but did not report on the effectiveness of their program.²⁰

The Cambodian Health Promotion Program

The Harvard Program in Refugee Trauma (HPRT) has been caring for survivors of torture since it began as the Indochinese Psychiatry Clinic in 1981. Its clinical work over the past 31 years has focused on caring

for Southeast Asians—mostly Cambodians. As this population aged, HPRT recognized the increasing burden of chronic medical disease in their patients. In 2000, HPRT responded by initiating the Cambodian Health Promotion Program (CHPP). As described in *Healing Invisible Wounds*, the CHPP began in a community center in Lowell, Massachusetts as a ten-class course in a small group setting covering a broad range of medical and trauma-related topics.²¹ In 2007, when HPRT moved the CHPP to a primary care center in Lynn, Massachusetts, they limited the program to five sessions so that the course could be offered more times every year and reach more people. Our paper describes the curriculum and results from the CHPP in its current five-session group format.

Methods

Educational philosophy of the CHPP

A multidisciplinary team at HPRT designed and implemented the CHPP consistent with the model offered by the Office of Refugee Resettlement²² and the Cambodian Elders Council of Lowell²³. The CHPP team at HPRT included a psychiatrist; a social worker; a Cambodian community health worker; a Cambodian mental health counselor; and a medical student working as a research fellow.

The team designed the process and content of the CHPP based upon an expanded definition of the World Health Organization definition of health²⁴ to include self-healing practices learned from the scientific literature and clinical experience.²¹ Health is seen as “a dynamic, active process of maintaining a personal and social state of balance and well-being.” Patients are the key agents in promoting their own healing. The group process is well suited to helping participants regain this sense of power over

their own health. With skillful group facilitation, group members address their feelings of powerlessness and make constructive changes.²⁵ The group process also reduces shame and isolation.²⁵ Small groups (about seven to nine participants) provide the ideal intimacy and focused discussion for providing this social support.

Throughout the health promotion groups (HPGs), the CHPP team adapts the teaching technique to the Cambodian audience. Each session is co-facilitated by an American mental health practitioner and a Cambodian community health worker. The co-facilitators integrate Khmer health concepts with evidence-based biomedicine and encourage participants to take an informed and integrated approach to their health. Since the Cambodians’ cultural pride has been wounded by the genocide of the Khmer Rouge era, honoring their cultural traditions is a particularly important way to counteract this humiliation.

Not only the HPGs’ curriculum, but also their philosophy and process, speak to Cambodian values. A review of multidisciplinary literature on Southeast Asian refugees identified kinship solidarity and the search for equilibrium as two key cultural themes to use in designing health promotion strategies.²⁶ The CHPP’s group process and philosophy of health as a state of balance speak to these cultural values.

The lesson plans were designed to keep educational messages simple and few, and to allow time for interpretation and discussion. The facilitators found that it could take four times as long to interpret the teaching points into Khmer and discuss them as it would to lecture about the topics in English. The co-facilitators and the participants give concrete examples to illustrate the teaching points. Khmer language educational resources, such as handouts and videos, are also

used. The co-facilitators prefer illustrated handouts to those with only text because many participants are illiterate in both English and Khmer. The HPG co-facilitators are increasingly using humorous props to make the lessons more accessible, memorable and fun. Indeed, laughter itself can aid in the healing of physical and mental disorders by stimulating positive physiological and immune responses.²⁷

Curriculum

The content of the curriculum centers on five key health behaviors: nutrition, physical activity, stress management, sleep hygiene, and health care practitioner-patient communication.

Session 1 introduces the five-session course by addressing the question: What is health promotion? It introduces the concepts of health promotion and disease prevention by discussing risk and protective factors for specific illnesses. The co-facilitators establish rapport by inviting the participants' perspectives and encouraging discussion. They express appreciation, knowledge, and respect for Khmer healing traditions and cultural history. They set expectations for the course by explaining the structure of the course, its expected benefits and what they expect of the participants. The co-facilitators work to create a nonjudgmental atmosphere where participants can feel comfortable asking questions and sharing what they have learned from their own experiences.

Session 2 teaches basic principles of nutrition and their connection to disease prevention. These guidelines are explained within the context of Cambodian cuisine. For example, when teaching about healthy sources of protein, the co-facilitators acknowledge fish as a healthy feature of traditional Cambodian diet. Likewise, when teaching about sodium reduction for blood

pressure control, they recommend limiting the consumption of those traditional Cambodian foods that are high in sodium, such as *prahok* (a salted fish paste). They accommodate the participants' low literacy by giving them a nutritional guide with pictures of healthy and unhealthy foods.

In session 3, the co-facilitators give guidelines on physical activity, explain its benefits for mental and physical health, and lead exercises together. They recommend aerobic exercise, strength training, and stretching. They recommend consulting health care professionals to help design the right exercise regime for each individual. This recommendation is particularly important for this population, because chronic pain is common among survivors of torture. Many patients require evaluation and treatment by a physical therapist. Finally, the co-facilitators demonstrate the accessibility and fun of exercise by doing low impact exercises together.

In session 4, the group discusses stress, depression and sleep. The co-facilitators teach about the stress response and its connection with chronic disease. They discuss stress reduction techniques and lead the practice of a relaxation response exercise together in class. They normalize how stress is a universal experience and depression is common among survivors of the Pol Pot regime. Mental health is discussed using both Cambodian and Western conceptions. For example, depression is discussed using the Khmer terms *pibaak chet* and *pruoy chet*. *Pruoy chet* is the deep sadness inside a person with extreme suffering that leads the person to withdraw from the world. The sadness is noticeable to others as the person is obviously upset. *Pibaak chet* is emotional suffering due to misfortune. Usually the emotional distress is not visible to others.²⁸ Since poor sleep is a common complaint in

this population, this session includes some basic guidelines for sleep hygiene. For all of these problems, the co-facilitators recommend both self-management and seeking professional help when that is not enough.

In session 5, patients are encouraged to take an active role in relationship to their health care team. The co-facilitators acknowledge the traditional deference to the authority of the doctor in Cambodian culture and encourage a more collaborative approach. They recommend that patients prepare for their doctors' visits and ask for explanations of anything they do not understand. The co-facilitators end the course by congratulating the participants and giving them certificates of completion.

A more detailed description of the curriculum is available upon request to HPRT.

The procedures were in accordance with the ethical standards of the institutional review boards (IRBs) of Massachusetts General Hospital and Albert Einstein College of Medicine; and with the Helsinki Declaration of 1975, as revised in 1983.

Participants

The study's 126 participants were recruited as a convenience sample of Cambodians via health care referrals and, to a lesser extent, by community health worker recruitment in the local community. The health care referrals recruited patients from behavioral health and primary care. Recruitment sites in the local community included the Cambodian Buddhist temple and Cambodian grocery stores.

Eligibility criteria included being a primary or secondary Cambodian survivor of torture. All participants had been screened using HPRT's intake instrument that assesses the torture experience of all HPRT patients. This intake instrument includes the

trauma/torture events of the Harvard Trauma Questionnaire (HTQ)²⁹. Only those patients who are torture survivors are eligible for treatment in HPRT's clinic. Victimization under the Khmer Rouge regime (also known as the Pol Pot genocide) between 1975 and 1979 qualifies as torture according to the US definition of torture in Title 18:

- (1) "torture" means an act committed by a person acting under the color of law specifically intended to inflict severe physical or mental pain or suffering (other than pain or suffering incidental to lawful sanctions) upon another person within his custody or physical control;
- (2) "severe mental pain or suffering" means the prolonged mental harm caused by or resulting from—
 - (A) the intentional infliction or threatened infliction of severe physical pain or suffering;
 - (B) the administration or application, or threatened administration or application, of mind-altering substances or other procedures calculated to disrupt profoundly the senses or the personality;
 - (C) the threat of imminent death; or
 - (D) the threat that another person will imminently be subjected to death, severe physical pain or suffering, or the administration or application of mind-altering substances or other procedures calculated to disrupt profoundly the senses or personality...³⁰

In addition, the CHPP participants had to be over age 18 and had to have a willingness to participate in the program. Both men and women were eligible to participate. The participants were enrolled and participated from 2007 to 2011. The target enrollment for each group was eight participants.

Participants received no monetary

compensation for their participation. They were served healthy snacks when attending the course. Upon completion of at least four out of five classes, they received complimentary passes to the local YMCA. While the program itself did not provide transportation for participants, it did connect them with existing free transport services that were available in the community.

Measurement

Instruments

A Pre and Post Health Promotion Questionnaire (HPQ) was developed by HPRT, translated into Khmer and administered in a semi-structured interview by the HPRT Cambodian community health worker. The Pre and Post HPQ consists of the following elements.

Depression symptoms were assessed using the 15 depression items from the Cambodian version of the Hopkins Symptom Checklist (HSCL). The HSCL has been found to reliably measure depression symptoms in highly traumatized patients.³¹⁻³⁴ Each depression symptom is rated as (1) Not at all, (2) A little, (3) Quite a bit, or (4) Extremely. The depression score is calculated by adding up all responses and dividing by the number of items answered. A patient whose depression score is equal to or greater than 1.75 is considered “checklist positive,” that is, presumptively demonstrating major depression.

The items of the HPQ on self-perception of health, energy, bodily pain, and social functioning were adapted from the Short Form – 36 (SF-36), a commonly used English-language health survey. The SF-36 survey is a validated questionnaire designed for use in clinical practice and research, health policy evaluations, and general populations surveys. It measures physical health, mental health, social functioning, vitality,

and general health perceptions. A large study has supported the use of the SF-36 survey across diverse populations.³⁵

For the three items on self-perception of health, energy, and bodily pain, the HPQ maintains the SF-36’s five-point scale with one indicating a low rating of the variable in question and five indicating a high rating of that variable. However, the HPQ uses a different scale for social functioning than the SF-36. The original SF-36 item on social functioning asks, “During the past four weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting friends, relatives, etc.)?” and provides a five-point scale for responses ranging from (1) all of the time to (5) none of the time. Our item on social functioning asks, “How many days out of the past week were you totally unable to work or carry out your normal activities because of your health?” Then the participant responds with an answer ranging from 0 to 7 “days out of role”. So, in the HPQ, a lower number response for this item indicates higher social functioning.

The remaining items were newly written for the HPQ. Several assessed health behaviors in terms of their duration or frequency. The items on exercise/activity level and relaxation/meditation asked how many minutes per week they engaged in these activities. Sleep was assessed by asking how many hours they sleep per night, with the possible responses being: (1) Less than 4, (2) 4-5, (3) 6-8, and (4) More than 8. Nightmares were assessed in terms of their frequency: (1) daily, (2) several times a week, (3) several times a month, or (4) several times a year. Please note that here a higher number response indicates a reduced frequency of nightmares.

The HPQ, in addition, included four confidence questions:

1. How confident are you that your health can improve?
2. How confident are you in understanding the causes of your illnesses?
3. How confident are you that you can explain your health problems to your doctor?
4. How confident are you that your doctor can understand you?

The possible responses were (1) Not Confident, (2) A Little Confident, (3) Somewhat Confident, and (4) Extremely Confident.

Analyses

Analyses were done using the Statistical Package for the Social Sciences (SPSS). T-tests and one-way ANOVA tests were used to measure differences between the Pre and Post evaluation scores by age groups and gender.

Results

The demographic background of the HPGs is shown in Table 1. As recorded in their medical records at the community health center, the patients were uneducated, came from rural areas of Cambodia, and resettled in the United States in the 1980s.

This study reveals significant improvement in depressive symptoms, healthy lifestyle behaviors, and confidence in accessing the health care system experienced by the Cambodian survivors of torture who participated in our health promotion groups (HPGs). Table 2 shows the significance of percentage change between the Pre and Post HPG experience. There was a marked reduction in depressive symptoms from 52.8% of participants who were checklist positive for depression to 44.0%. The portion rating their health status in the lowest category as “poor” dropped from 20.0% to 7.2%. In the Post data, 80.8% were exercising at

least 120 minutes per week, with only 1.6% stating that they did not exercise at all. Participants also spent more time in relaxation using meditation. Table 2 also reveals dramatic improvement in sleep and reduced nightmares. Most significantly, after the HPG only 2.4% of participants felt their health could not improve; none felt their doctor could not understand them; and none felt that they were unable to explain their problems to their doctor.

Table 2 presents the results using mean scores for each HPQ item. All 15 items on the HSCL depression scale revealed significant improvement. All other HPQ items changed significantly for the better except for relaxation per week (in minutes) and the presence of nightmares.

Figures 1 and 2 graphically illustrate the changes in mean score for all HPQ items. Figure 1 reveals dramatic improvement in days out of social role along with “confident understanding causes of illness,” and “confident health can improve.” Figure 2 demonstrates that, among the 15 depression items of the HSCL, “feeling worthless” and “difficulty sleeping” revealed the greatest improvement. “Feeling blue,” “feeling hopeless,” and “feeling lonely” form a significant cluster of symptoms that also significantly improved. “Worry” which had the highest pre-test severity of all the symptoms also improved. All other HSCL items also shifted significantly to the left, demonstrating improvement.

The changes between the Pre and Post HPQ results, in summary, demonstrate the following:

1. *Improved sense of overall well-being.* Participants reported improved health, increased energy, decreased impairment from pain, and increased social functioning.
2. *Increased minutes of exercise per week.*
3. *Improved sleep.* Participants reported less

difficulty sleeping, increased hours of sleep per night, and decreased frequency of recurring nightmares.

4. *Improved confidence in health care utilization skills.* Participants reported increased confidence that their health can improve; that they understand the causes of their illnesses; that they can explain their health problems to their doctors; and that their doctors can understand them.
5. *Improved mood.* Participants reported decreased severity of all the depression symptoms on the HSCL.

Discussion

The results of our study suggest that a brief intervention may improve confidence, knowledge, mood, health behaviors and overall sense of well-being in Cambodian survivors of torture. Participants seemed to gain benefit from the HPGs, despite their generally low level of formal educational attainment. Few participants began with any knowledge of Western concepts of health and healthy lifestyle practices. They had much to gain from simply learning these basic concepts in the HPGs. Improvements may not only be due to gaining knowledge but to gaining a greater sense of confidence in their medical care and a sense of social connectedness from having a shared group experience. Indeed the social experience of the group may be partially responsible for the significant reductions in feelings of “worthlessness” and “feeling trapped.” When participants can listen to and be heard by peers who share their struggles, they may feel more validated and accepted, leading to greater feelings of self-worth. Likewise, the social experience may help liberate them from feelings of social isolation. Cultural stereotypes may make one expect that Cambodians would not want to disclose personal health problems in a group setting, but our results suggest that groups

are a culturally effective format for Cambodian health promotion.

While the overall HSCL score for depression dropped under the checklist positive score of 1.75, item by item symptoms all improved including the most severe, “worry,” “low energy,” and “difficulty sleeping”. This graphic display reveals that clinicians should be sensitive not only to diagnosis but also to the individual items of emotional distress characterizing depression. “Worry,” for example, was the most severe presenting symptom of depression. (See Figure 2.) The prominence of “worry” is consistent with past descriptions of common symptom profiles in Cambodian survivors of torture seeking care. Mollica et al’s 1984 study of Cambodian psychiatry outpatients at the Indochinese Psychiatry Clinic in Massachusetts found similar results on the HSCL-25.³⁶ This study was conducted within several years of the subjects’ traumatic experiences under the Khmer Rouge and in refugee camps. The initial Mollica et al. study also had a similar item-by-item graphic analysis of the HSCL symptoms of depression.

Participants on the pretest before the HPG experience reported limited confidence in their ability to communicate with their doctors. To interpret this finding, consider the fact that most participants were patients at a healthcare center with a Cambodian physician and Cambodian nursing staff. This access to Cambodian healthcare staff may have made patients’ confidence in their health communications higher than they would be in a care setting without Khmer-speaking staff. Despite this linguistic and cultural common ground, a gap in mutual understanding still remained. While participants on average were initially “somewhat confident” in their ability to communicate with their doctors, they were not “extremely

confident” in this ability. The HPG experience appeared to help the participants reduce communication barriers with their doctors, as well as helped the patients better understand and apply healthy lifestyle behaviors in their own lives.

Overall improvement was seen in all items for all participants combined. However, only for “confidence” items were there significant differences in the degree to which different demographic groups improved. Younger participants (under age 50), at baseline, had more confidence in their ability to explain their health problems to the doctor than the older participants, and so did not reveal great gains in this skill. Older men did not attain as much confidence as women that their doctor could understand them. However, there was no difference between younger men and younger women on this item.

This study suggests that culturally tailored Cambodian health education, and HPGs in particular, can improve health and health behaviors in this population. Our pilot study is consistent with the Racial and Ethnic Approaches to Community Health (REACH) project, a Centers for Disease Control and Prevention (CDC) program to eliminate racial and ethnic disparities in health. REACH projects in Seattle and King County, Washington using educational classes and support groups have revealed increased physical activity and healthier eating, and increased self-efficacy in managing diabetes in Cambodian and other ethnic groups.³⁷ Another REACH project in the Cambodian community in Lowell, Massachusetts providing culturally tailored health education in order to promote healthy behaviors showed that smoking prevalence decreased in this Cambodian community at a greater rate than nationwide over the same period of time.³⁸ More than 50% of the

project’s educational workshop and peer support group attendees reported behavioral changes (e.g., limiting salt and/or sugar intake) as a result of attending the group.²³

The importance of using health education in small group settings is emerging as a major clinical intervention for patients with chronic diseases such as diabetes and obesity^{25, 39}

Limitations

This study was conducted as a pilot to evaluate clinical outcomes and as such it suffers from methodological weaknesses. It lacks a control group. It has selection bias, resulting from who was invited to the course, chose to come, and stayed. Since many of the participants were patients recruited by their behavioral health care providers, our sample may report more severe psychiatric symptoms, and then would not be representative of the general local Cambodian population. Also, since the HPGs took place in the early afternoon, the sample was likely biased towards those who are not working. While the overall curriculum topics were constant throughout the study period, the exact way they were taught in the program varied over time. The Cambodian health educator who taught the course was the same person who administered the instruments, so this dual role introduces another possible source of bias. Our data show correlations from which causation cannot be inferred. Like other Cambodian health education programs, CHPP also offered screening and referral to appropriate services. The CHPP also encouraged participants to use allopathic and traditional healing methods they found helpful; and to discuss these practices with their health care team. As such, the effects of education versus those of increased health care utilization (allopathic or traditional) cannot be disaggregated. Finally, there was a lack of long-term follow-up data to see if

these improvements were sustained. Substantial resources would have been needed to address the methodological weaknesses of this unfunded study.

Key unanswered questions are: are the benefits of the Cambodian Health Promotion Program sustained over time? Are these groups more efficacious than conventional care? Do different characteristics such as level of education and types/severity of trauma/torture events affect ability to profit from these groups? What is necessary to maintain these benefits over time? Addressing these questions would require a control group study with a larger and more diverse sample size. Long-term follow-up – for example, by repeated evaluations at one and five years after program participation would also be valuable.

Despite these limitations, this pilot study suggests that HPGs are a promising intervention worthy of further implementation and investigation. Future program development could seek to optimize the content, format, and pedagogy of the program. Future research could systematically assess the clinical effectiveness of HPGs.

Conclusion

Our study suggests that improvements in health, health behaviors, sleep, confidence, and depression symptoms can occur through participation in our Cambodian Health Promotion Program. Our data reveals the potential benefits of culturally tailored health education in a small group setting for Cambodian survivors of torture. Even though this is a pilot study, these findings offer a pathway for torture survivors and their health practitioners to improve the health and medical care of survivors. Our study suggests that culturally tailored health education in a small group setting may promote healing in survivors of torture. The

key elements of this model of health education are (1) identification of topic areas based on needs assessment; (2) integration of the survivors' culture into an evidence-based curriculum; (3) small group process; and (4) systematic evaluation. We suggest that it is feasible to incorporate health promotion groups for survivors of torture into a comprehensive program of community-based health care.

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For more information about the Cambodian Health Promotion Program, please contact the Harvard Program in Refugee Trauma by emailing stor@partners.org or calling 617-876-7879.

Table 1: Demographic characteristics of Health Promotion Group (HPG) participants (n=126)

Demographics	Percentage
Age	
50 and younger	22.4%
51-60	46.4%
61+	31.2%
Gender	
Female	64%
Male	36%

Table 2: Health Promotion Questionnaire (HPQ) responses in terms of percentages of participants (n=126)

Health Promotion Questionnaire Items	Pre HPQ	Post HPQ	p
Health			
Health rated as "poor"*	20.0%	7.2%	.001
Energy rated "none" to "a little"*	39.2%	17.6%	.000
Bodily pain rated as "moderately" to "extremely"*	42.4%	29.6%	.011
Social functioning:			
Reporting 3 or more days out of role*	36.8%	26.4%	.042
Health behaviors			
Exercise of less than 120 minutes per week*	44.0%	19.2%	.000
Did not exercise at all*	12.8%	1.6%	.001
Relaxation of less than 60 minutes per week*	61.6%	48.0%	.004
Did not relax at all*	51.2%	36.0%	.002
Sleep			
Less than 4 hours per night*	25.6%	10.4%	.000
Daily nightmares*	13.6%	3.3%	.011
Confidence items (4-point scale)			
Not confident that health can improve*	21.6%	2.4%	.000
Not confident understanding causes of illnesses*	19.2%	2.4%	.000
Not confident can explain health problems to doctor*	7.2%	0%	.002
Not confident doctor can understand you*	4.0%	0%	.025
Depression score greater than or equal to 1.75*	52.8%	44.0%	.034

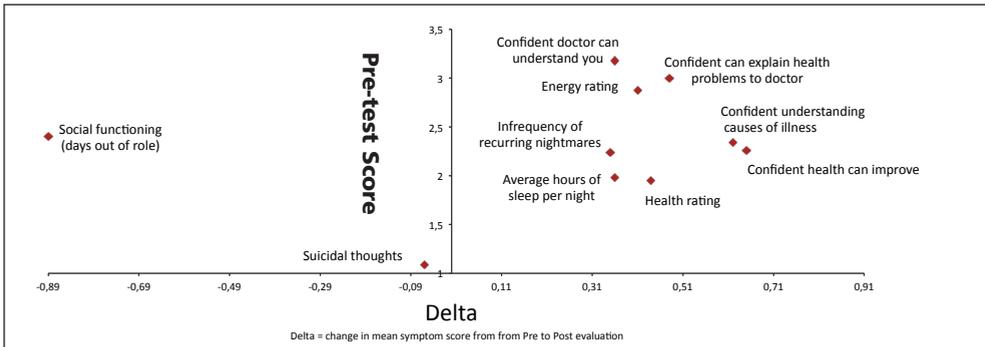
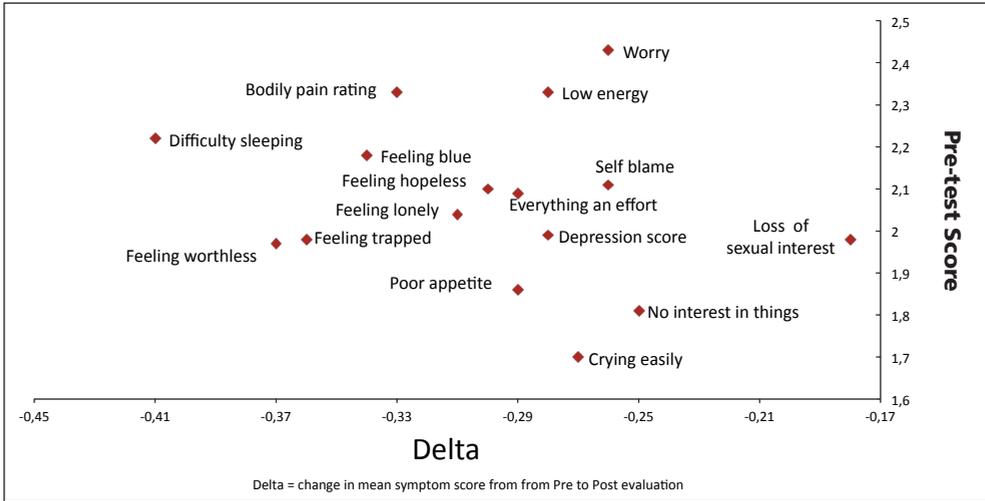
Table 2

Health Promotion Questionnaire items	Mean Pre score	Mean Post score	Delta (mean change)	P
Health				
Health rating (5-point scale)*	1.95	2.39	-0.44	0.000
Energy rating (5-point scale)*	2.88	3.29	-0.41	0.000
Bodily pain rating (5-point scale)*	2.33	2.00	0.33	0.001
Social functioning (days out of role)*	2.40	1.51	0.89	0.019
Health behaviors				
Exercise per week (minutes)*	159.63	195.6	-35.97	0.004
Relaxation per week (minutes)	64.76	81.85	-17.09	0.150
Sleep				
Average hours of sleep per night (4-point scale)*	1.98	2.34	-0.36	0.000
Presence of recurring nightmares	0.77	0.73	0.04	0.258
Infrequency of recurring nightmares (4-point scale)*	2.24	2.59	-0.35	0.001
Confidence items (4-point scale)				
Confident health can improve*	2.26	2.91	-0.65	0.000
Confident understanding causes of illnesses*	2.34	2.96	-0.62	0.000
Confident can explain health problems to doctor*	3.00	3.48	-0.48	0.000
Confident doctor can understand you*	3.18	3.54	-0.36	0.000
Depression symptoms (4-point scale)				
Low energy*	2.33	2.05	0.28	0.000
Self blame*	2.11	1.85	0.26	0.002
Crying easily*	1.70	1.43	0.27	0.000
Loss of sexual interest*	1.98	1.80	0.18	0.005
Poor appetite*	1.86	1.57	0.29	0.000
Difficulty sleeping*	2.22	1.81	0.41	0.000
Feeling hopeless*	2.10	1.80	0.30	0.000
Feeling blue*	2.18	1.84	0.34	0.000
Feeling lonely*	2.04	1.73	0.31	0.000
Suicidal thoughts*	1.09	1.03	0.06	0.020
Feeling trapped*	1.98	1.62	0.36	0.000
Worry*	2.43	2.17	0.26	0.000
No interest in things*	1.81	1.56	0.25	0.000
Feeling everything is an effort*	2.09	1.80	0.29	0.000
Feeling worthless*	1.97	1.60	0.37	0.000
Depression score*	1.99	1.71	0.28	0.000

*Difference between Pre and Post scores was statistically significant ($p < 0.05$).

Note: The direction of change for all items indicates improvement.

Figures 1 & 2: Changes in mean scores from Pre to Post Health Promotion Questionnaires



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