Improving the Health and Mental Health of People Living With HIV/AIDS: 12-Month Assessment of a Behavioral Intervention in Thailand

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Objectives. We examined findings from a randomized controlled intervention trial designed to improve the quality of life of people living with HIV in Thailand.

Methods. A total of 507 people living with HIV were recruited from 4 district hospitals in northern and northeastern Thailand and were randomized to an intervention group (n=260) or a standard care group (n=247). Computer-assisted personal interviews were administered at baseline and at 6 and 12 months.

Results. At baseline, the characteristics of participants in the intervention and standard care conditions were comparable. The mixed-effects models used to assess the impact of the intervention revealed significant improvements in general health (B=2.51; *P*=.001) and mental health (B=1.57; *P*=.02) among participants in the intervention condition over 12 months and declines among those in the standard care condition.

Conclusions. Our results demonstrate that a behavioral intervention was successful in improving the quality of life of people living with HIV. Such interventions must be performed in a systematic, collaborative manner to ensure their cultural relevance, sustainability, and overall success. (*Am J Public Health.* 2010;100:2418–2425. doi:10.2105/AJPH.2009.185462)

People living with HIV/AIDS in Thailand face multiple challenges, including coping with HIV-related disclosure and stigma and maintaining positive family relationships. HIV disclosure has been identified as a key stressor for people living with HIV in Thailand[1–3]; when patients do not disclose their serostatus, their odds of becoming depressed increase 3-fold.[4] Disclosure is also a key issue among Thai HIV support groups.[5] Once individuals disclose their serostatus to their partners and family members, treatment becomes a challenge for the entire family.

In addition to disclosure, it is necessary to address stigma as an HIV-related stressor. We have documented a high level of perceived stigma in Thailand and associations with other conditions, including a significant association between stigma and depression.[6] People living with HIV in Thailand also face challenges with respect to maintaining general health routines,[7] including medical visits, prophylactic treatment of symptoms (e.g., hepatitis C virus, pneumonia, tuberculosis),[8] adherence to antiretroviral therapy (ART),[9] knowledge of the course of their disease, and effective communication with doctors.

By contrast, other factors have been shown to have a positive effect on management of HIV. For example, Thailand is a strongly family-oriented society, and typical Thai families are tightly knit. Therefore, family social support may help people living with HIV increase their adherence to ART and decrease their risk of depression.[9,10] Parents of children living with HIV need information about how their children may respond to their illness, how to parent children while dealing with their own illness, how to maintain positive family routines, and how to generate positive parental bonds with their children. Knowledge in such areas is hypothesized to improve patients' quality of life and their children's long-term adjustment.[11–13]

Past behavioral interventions in Thailand have framed HIV as an individual stressor for people living with the disease.[14,15] To address the multiple negative and positive factors faced by people living with HIV and their families in Thailand, we conducted a randomized controlled intervention trial in the northern and northeastern areas of the country. On the basis of the work of Rotheram-Borus et al.,[13,16–21] we identified common factors, processes, and principles shared across evidence-based interventions[22–24] and adapted them to address the specific needs of people living with HIV in Thailand. Here we describe findings based on data collected at baseline, 6 months, and 12 months to assess the efficacy of a cognitive-based intervention designed to improve the quality of life of people living with HIV.

METHODS

We collected baseline data in 2007 from 4 district hospitals in the 2 study regions (2 district hospitals per region). Initial screenings of people living with HIV were conducted in the district hospitals by health care workers and research staff specifically hired for the study. Once patients had been screened and had agreed to participate in the study, written informed consent was obtained.

Subsequently, a trained interviewer administered the assessment using computer-assisted personal interview techniques. During the interview, data were collected on participants' demographic characteristics, including age, gender, annual income, and educational status, and participants were asked about perceived stigma, social support, and depression. A total of 507 people living with HIV voluntarily participated in the assessment. The refusal rate was approximately 5% across the 4 study sites.

After completion of the baseline assessment, participants were randomized to the intervention condition (n=260) or the standard care condition (n=247). Participants in both conditions were assessed at 6 months and 12 months. All participants received 300 Baht (equivalent to $10) for taking part in each of the assessments.

Intervention

We adapted the core elements of the Rotheram-Borus et al. US intervention to the Thai setting through a series of workgroups involving the US research team, the Thai research team, and health care providers at the provincial and district levels. The workgroups developed the intervention sessions to fit the Thai context by applying common intervention factors, processes, and principles.[22–24] Each session was participatory and was designed to focus on 1 or 2 challenges faced by people living with HIV and their families.

Buddhism, which is the religious affiliation of 95% of the Thai population,[25] played a key role in framing intervention tools and activities. In particular, the pragmatic, empirical aspects of Buddhism proved useful in framing intervention content and activities; its emphasis on personal responsibility, its support of personal betterment, and its attention to impermanence and change all played a key role in shaping the intervention.

Across all sessions, key intervention tools were framed in a culturally relevant and acceptable way to ensure the acceptability of the intervention. For example, we used a "feeling thermometer" to help participants understand their current feelings and emotions, thus enhancing their self-awareness. In addition, we adapted the feel–think–do model to promote a positive cycle of cause and effect, a concept closely linked to positive thinking in dealing with HIV-related challenges as well as to Buddhist philosophy.

The 3 modules from the US intervention (HIV-related stressors, improving health and mental health, and improving family adjustments) were adapted to 4 modules in the Thai intervention (healthy mind, healthy body, parenting and family relationships, and social and community integration) delivered over 13 weeks. Module 1 (healthy mind) included 4 weekly sessions: 1 each on emotional regulation while living with HIV, positive thinking and doing, HIV disclosure, and stress management. Module 2 (healthy body) involved 3 sessions: 1 each on medication adherence and access to care, prevention of HIV transmission to others, and self-care and healthy daily routines.

Module 3 (parenting and family relationships) consisted of sessions on family roles and relationships, parenting while ill, and long-term plans with family members and children. Finally, module 4 (social and community integration) included 2 sessions focusing on community participation and support and working while ill. A detailed intervention manual is available upon request.

Measures

All of the scales used in this study had been previously validated among Thai samples or developed locally by the Thai Department of Mental Health. Before launching the main trial, we conducted a pilot study of all of the measures to ensure their reliability and validity.

Outcome variables. Information on demographic characteristics (e.g., gender, age, and education level) was collected at the baseline interview. The main outcome measures were adapted from the Medical Outcomes Study HIV Health Survey instrument (MOS-HIV).[26,27] Three subscales from the MOS-HIV (general health, mental health, and physical health) were used in this study.

We assessed general health with the MOS-HIV general health subscale, which consists of 5 items.[27,28] Initially, participants were asked to rate their current health by reporting their general perception of their overall health status (1=excellent, 5=poor). Participants were also asked to report their general perception of their health (1=definitely true, 5=definitely false), as follows: I am somewhat ill; I am as healthy as anybody I know; my health is excellent; and I have been feeling bad lately. The 4-item subscale was transformed into a 100-point scale (higher scores reflecting better general health), and the scale had acceptable internal consistency (Cronbach α=0.72).

The MOS-HIV health distress and emotional well-being subscale, consisting of 8 items, was used to assess mental health.[27,28] Participants were asked to rate their level of distress and emotional well-being in the preceding month. They were asked how often (1=all of the time, 6=none of the time), during that period, they had been nervous, felt calm and peaceful, felt downhearted and blue, felt that nothing could cheer them up, felt weighed down by their health problems, felt discouraged by their health problems, felt despair over their health problems, and were afraid because of their health. The 8-item subscale was transformed into a 100-point scale (higher scores reflecting better mental health), and the scale had a high internal consistency (Cronbach α=0.85).

We assessed physical health with the MOS-HIV physical functioning subscale, which consists of 6 items.[27,28] Participants were asked what activities they might engage in during a typical day and the extent to which their health limited those activities (0=did not limit, 1=marginally limited, 2=greatly limited). The 6 activities measured were as follows: vigorous activities such as lifting heavy objects, running, or participating in strenuous sports; moderate activities such as moving a table or carrying groceries; walking uphill or climbing; bending, lifting, or stooping; walking around for 1 block; and eating, dressing, bathing, or using the toilet. The subscale was transformed into a 100-point scale (higher scores reflecting better physical health), and the scale's internal consistency was satisfactory (Cronbach α=0.81).

Independent variables. We assessed the impact of the intervention by comparing the differences in the levels of particular outcome measures between members of the intervention and standard care groups over 12 months. We also compared outcome-level trajectories over 12 months according to intervention status.

A 15-item depressive symptomatology screening test developed and used previously in Thailand was used to assess depression.[29] Participants were asked about problems that had bothered them in the preceding week (e.g., feeling depressed most of the time, feelings of hopelessness or worthlessness, or loss of self-confidence); ratings were made on a scale ranging from zero (not at all) to 3 (usually [5–7 days a week]). A summative composite scale was developed with a range of zero to 45, and this scale had excellent internal consistency (Cronbach α=0.91).

We assessed HIV disclosure with a single measure based on the extent to which participants had disclosed their serostatus to, for example, sexual partners, coworkers, family members outside the household, health care workers, and village leaders (0=no one, 1=some, 2=all). This measure had been used and validated in Thailand.[30] We developed a summative composite scale based on 8 questions about HIV disclosure with a range of zero to 16 (Cronbach $\alpha = 0.84$).

We measured internalized shame with an HIV-related stigma subscale based on the work of Herek and Capitanio[31] and validated in Thailand.[32] The subscale was composed of 9 items (e.g., I am punished by evil, my life is tainted, I am a disgrace to society). Response categories ranged from 1 (strongly disagree) to 5 (strongly agree). We created composite scores by combining all of the items (range = 9–45; Cronbach $\alpha = 0.83$).

The 4-item Medical Outcomes Study Social Support Scale was used to measure social support.[33] Participants were asked to indicate the frequency with which someone was available to help them if they were confined to bed, to take them to a doctor if needed, to prepare their meals if they were unable to do so, and to help them with daily chores if they were sick. Responses to individual items ranged from 1 (none of the time) to 5 (all of the time). The summative composite score ranged from 4 to 20, with a higher score indicating a higher level of social support (Cronbach $\alpha = 0.88$).

We assessed family functioning with the Thai Family Functioning Scale, which was adapted from the Family Assessment Device.[34] Consisting of 30 items (e.g., family members hardly expressed their love and care, I could not tell what my family members felt by the words they spoke), the scale's responses were scored on a scale ranging from 0 (never) to 3 (always). We developed a summative composite family functioning score with a range of 0 to 90; higher scores reflected better family functioning (Cronbach $\alpha = 0.92$).

Data Analysis

Before estimating the impact of the intervention on quality of life measures, we conducted exploratory data analyses to examine data patterns. We estimated mixed-effect models to fit each participant's outcome measures with the intervention effect, and potential covariates were included in the models. Such models made it possible to follow individual participants' trajectories over 12 months. The PROC MIXED procedure in SAS 9.1.3 (SAS Inc, Cary, NC) was used with an autoregressive covariance structure to account for repeated measures across the study period. We took into account correlations among participants in the same family by including random intercepts and slopes.

The time variable indicated the change in the outcome measure in the standard care condition over 12 months, and the intervention by time variable indicated the change in the outcome measure in the intervention condition (intervention effect) over the 12-month study period. For each quality of life outcome, the key variables included the intervention as the main predictor of interest after adjustment for background characteristics, baseline outcome levels, and other covariates associated with the baseline assessment outcomes.

RESULTS

Table 1 highlights the baseline characteristics of participants randomized to the intervention and standard care conditions. A majority of the participants were women (67.2%), and participants' mean age was 37.4 years. The high percentage of women in the sample reflects the heterosexual transmission pattern in the region, wherein large proportions of women have lost their husbands as a result of AIDS and are subsequently learning their own HIV status. Most of the participants had less than a high school education (85.4%), and the majority had an annual income of less than 35 000 Baht (approximately $1000). The average interval since HIV diagnosis was 8 years.

A comparison of baseline characteristics across the intervention and standard care conditions revealed that there were no significant differences in terms of gender, age, education level, annual income, or number of years since HIV diagnosis. Similarly, we found no between-group differences in depression, HIV disclosure, internalized shame, social support,

TABLE 1—Baseline Characteristics of People Living with HIV Randomized to the Intervention and Standard Care Conditions: Thailand, 2007–2009

Characteristic	Condition		
	Intervention (n = 260)	Standard Care (n = 247)	Total (n = 507)
Female, No. (%)	175 (67.3)	165 (67.1)	340 (67.2)
Age, y, mean (SD)	37.1 (6.2)	37.8 (7.0)	37.4 (6.6)
Education level, No. (%)			
Less than high school	223 (85.8)	210 (85.0)	433 (85.4)
Some high school or more	37 (14.2)	37 (15.0)	74 (14.6)
Annual income, Baht (US $), No. (%)			
≤15 000 ($430)	110 (42.3)	106 (42.9)	216 (42.6)
15 001–35 000 ($431–$1000)	62 (23.9)	69 (27.9)	131 (25.8)
35 001–55 000 ($1001–$1571)	53 (20.4)	49 (19.8)	102 (20.1)
>55 000 ($1571)	35 (13.5)	23 (9.3)	58 (11.4)
No. of years since diagnosis, mean (SD)	7.9 (4.0)	7.5 (3.7)	7.7 (3.8)
Depression score,[a] mean (SD)	12.2 (8.3)	12.4 (8.0)	12.3 (8.2)
HIV disclosure score,[b] mean (SD)	8.9 (4.5)	8.4 (4.5)	8.6 (4.4)
Internalized shame score,[c] mean (SD)	23.9 (6.1)	24.2 (6.2)	24.0 (6.1)
Social support score,[d] mean (SD)	68.3 (11.2)	68.3 (12.3)	68.3 (11.8)
Family functioning score,[e] mean (SD)	61.2 (13.7)	61.4 (14.3)	61.3 (14.0)
Quality of life outcome score, mean (SD)			
General health (range: 0–100)	49.4 (15.7)	52.8* (14.6)	51.1 (15.3)
Mental health (range: 0–100)	70.8 (18.1)	71.9 (18.0)	71.3 (18.1)
Physical health (range: 0–100)	80.2 (21.6)	83.3 (18.6)	81.7 (20.2)

[a] Range: 0–42.
[b] Range:1–14.
[c] Range: 9–45.
[d] Range: 29–90.
[e] Range: 10–90.
*$P < .05$, for the difference between intervention and standard care groups.

or family functioning, suggesting that the randomization resulted in well-balanced groups. With respect to the outcomes of interest, we found no significant differences in mental health and physical health between participants in the intervention and standard care conditions. However, general health scores were slightly higher among those in the standard care condition than among those in the intervention condition. We controlled for this baseline difference in the multivariate analysis.

Baseline Correlations

Table 2 presents baseline correlations across intervention status, demographics, and selected outcome measures. General health was negatively correlated with depression and internalized shame and positively correlated with social support and family functioning. Mental health was negatively correlated with female gender and positively correlated with social support and family functioning. Physical health was positively correlated with income, social support, and family functioning and negatively correlated with internalized shame and depression.

In addition, there were significant relationships among depression, internalized shame, social support, and family functioning. Depression was positively correlated with internalized shame and negatively correlated with social support and family functioning.

Intervention Efficacy

Table 3 summarizes the impact of the intervention among participants over 12 months for each of the outcome measures. Figure 1 illustrates the trends in each outcome measure over 12 months according to intervention status. With respect to general health outcomes, we found significant associations between general health and depression, internalized shame, and family functioning. Adjusting for the baseline difference in general health and other demographic characteristics, we observed a significant improvement in general health among participants in the intervention condition over 12 months and a decline in general health among participants in the standard care condition.

Similar to general health, we observed a significant improvement in mental health among participants in the intervention condition over 12 months and a relative decline in mental health among those in the standard care condition after controlling for baseline demographic characteristics and other predictors. We also found a marginal association between mental health and social support and a significant association between mental health and family functioning.

We found a significant inverse association between physical health and depression, as well as internalized shame. Adjusting for demographic characteristics and other predictors in the model, we found an improvement in physical health among participants in the intervention condition as well as those in the standard care condition. The difference in physical health between the 2 conditions over 12 months was not significant.

DISCUSSION

Our findings underscore the importance of expanding services for people living with HIV beyond their physical and medical needs. In addition to the medical challenges associated with living with HIV, people in Thailand with this disease face multiple mental, social, and behavioral challenges. Along with negative factors such as depression and perceived internalized shame that affect these individuals, however, there are protective factors associated with improving their quality of life.

TABLE 2—Baseline Correlation Coefficients, by Intervention Status, Demographic Characteristics, and Quality of Life Outcome Predictors: Thailand, 2007–2009

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Intervention status	1.00													
2. General health	–0.09	1.00												
3. Mental health	–0.03	0.49**	1.00											
4. Physical health	–0.07	0.47**	0.43**	1.00										
5. Female gender	0.004	–0.08	–0.13*	–0.06	1.00									
6. Age	–0.05	0.01	0.07	–0.02	–0.14	1.00								
7. Education level[a]	–0.02	0.02	0.02	–0.03	–0.09*	–0.13*	1.00							
8. Annual income[b]	0.05	0.03	0.08	0.10*	–0.18**	–0.09	0.18**	1.00						
9. Years since diagnosis	0.04	–0.05	–0.02	0.01	0.15*	–0.05	–0.04	–0.04	1.00					
10. Depression	–0.01	–0.39**	–0.72*	–0.40**	0.17*	–0.06	–0.01	–0.08	0.05	1.00				
11. HIV disclosure	0.06	0.03	0.03	0.04	–0.04	–0.02	–0.06	–0.12*	0.21**	–0.01	1.00			
12. Internalized shame	–0.01	–0.34**	–0.51*	–0.30*	0.07	0.08	–0.04	–0.01	–0.03	0.46**	–0.14*	1.00		
13. Social support	–0.003	0.12*	0.17*	0.11 *	0.02	–0.07	0.12*	0.10*	0.02	–0.18**	0.06	–0.13*	1.00	
14. Family functioning	–0.006	0.17*	0.20**	0.11*	–0.08	0.01	0.06	0.06	0.004	–0.19**	0.05	–0.18**	0.54**	1.00

Note. The sample size is n = 507.

[a] Referent: less than high school.

[b] Referent: less than 35 000 Baht (US $1000).

*$P < .05$; **$P < .001$.

TABLE 3—Impact of the Study Intervention on Quality of Life Outcomes Over 12 Months: Thailand, 2007–2009

	General Health		Mental Health		Physical Health	
	B (95% CI)	*P*	B (95% CI)	*P*	B (95% CI)	*P*
Female gender	0.02 (–1.77, 1.81)	.984	–0.08 (–1.56, 1.41)	.921	–1.85 (–4.20, 0.50)	.122
Age	–0.04 (–0.18, 0.10)	.591	0.10 (–0.01, 0.21)	.084	–0.23 (–0.41, –0.06)	.01
Education level[a]	–0.41 (–2.70, 1.87)	.723	0.37 (–1.57, 2.31)	.708	–2.30 (–5.30, 0.70)	.132
Annual income[b]	0.82 (–0.54, 2.18)	.234	0.71 (–0.59, 1.20)	.284	0.28 (–1.57, 2.13)	.765
Years since diagnosis	–0.05 (–0.26, 0.15)	.611	0.09 (–0.09, 0.27)	.347	–0.03 (–0.31, 0.24)	.817
Depression	–0.58 (–0.68, –0.47)	<.001	–1.34 (–1.43, –1.24)	<.001	–0.83 (–0.97, –0.69)	<.001
HIV disclosure	0.04 (–0.13, 0.22)	.642	–0.06 (–0.22, 0.10)	.437	–0.03 (–0.26, 0.20)	.803
Internalized shame	–0.43 (–0.57, –0.30)	<.001	–0.55 (–068, –0.42)	<.001	–0.36 (–0.55, –0.18)	.001
Social support	0.02 (–0.05, 0.09)	.650	0.05 (–0.01, 0.12)	.08	0.06 (–0.03, 0.16)	.197
Family functioning	0.08 (0.02, 0.14)	.008	0.06 (0.01, 0.12)	.02	0.03 (–0.04, 0.11)	.396
Standard care change over 12 mo	–1.22 (–2.25, –0.19)	.021	–1.07 (–2.07, –0.07)	.04	0.28 (–1.14, 1.70)	.695
Intervention impact over 12 mo	2.51 (1.10, 3.92)	.001	1.57 (0.20, 2.93)	.02	1.47 (–0.47, 3.41)	.138

Note. CI = confidence interval. The sample size is n = 507.
[a] Referent: less than high school.
[b] Referent: less than 35 000 Baht (US $1000).

For instance, we observed that family functioning was positively associated with an individual's perceived general health. Such negative and positive factors are interconnected and call for integrated interventions to address the complexity of the challenges faced by people living with HIV and to improve their ability to cope with the illness.

We have provided evidence that the quality of life of people living with HIV can be improved by a behavioral intervention. We found significant improvements in both general health and mental health among participants in the intervention condition over 12 months.

We used 2 of the intervention's 4 modules (focusing on health and mental health) to address specific challenges faced by people living with HIV and their families face in Thailand. Our findings suggest that programs must be culturally adapted to ensure their long-term effectiveness. For instance, in targeting mental health, we learned that feelings of guilt are dominant themes in coping with HIV status in Thailand. This concept of guilt is highly relevant and identifiable in Thai Buddhist philosophy[35] and was fully integrated into the intervention.

Our findings demonstrated the importance of adaptations to local culture as a better choice than "one-size-fits-all" packaged interventions.[36] Furthermore, by incorporating the intervention sessions into the routine health care system of district hospitals, we were able to involve service providers at the local level and implement the intervention activities at the routine care setting to maximize the possibility of sustainability. Thus, the mental health of people living with HIV and other vulnerable populations can be improved without the need for substantial additional resources.

We found no significant intervention effect on our participants' physical health. This finding was anticipated in that all of the individuals who participated in our trial were recruited from district hospitals where they had continuous access to care, including access to ART. Additional resources from our intervention session focused more on addressing the mental health and family relationship challenges faced by patients in coping with the disease than on the patients' physical health. Therefore, although the improvements in participants' perceived mental health and general health may eventually translate to better perceived physical health, we may not have been able to observe this relationship within the confines of the 12-month follow-up period.

We found significant relationships between family functioning and participants' perceived general and mental health. As mentioned, Thailand is a strongly family-oriented society. However, families of those living with HIV face many challenges that can compromise family functioning, such as health-seeking demands, treatment adherence, stress, financial difficulties, and stigma, both within and outside the family. During difficult times, it becomes particularly important for families to stay close and to help and support each other. The quality of life of people living with HIV and their family members can be maintained if the family as a unit is able to successfully overcome these challenges. To examine the impact of the intervention on family members, we are in the process of finalizing data collection on the intervention that was provided to family members who were aware of each participant's serostatus.

Our findings revealed significant effects of depressive symptoms and internalized shame on participants' quality of life, including the measure of physical health. Previous studies have demonstrated that mental health issues are closely associated with the experience of living with HIV/AIDS and with the course and management of the disease. For instance, depressive symptoms have been shown to be associated with disease progression and to be a significant barrier to ART adherence.[37–40] Although we were not able to show the efficacy of the intervention with respect to physical health, the relationships between mental health and general and physical health are evident. Our results imply that mental health interventions can lead to improved medical and treatment outcomes for people living with HIV.

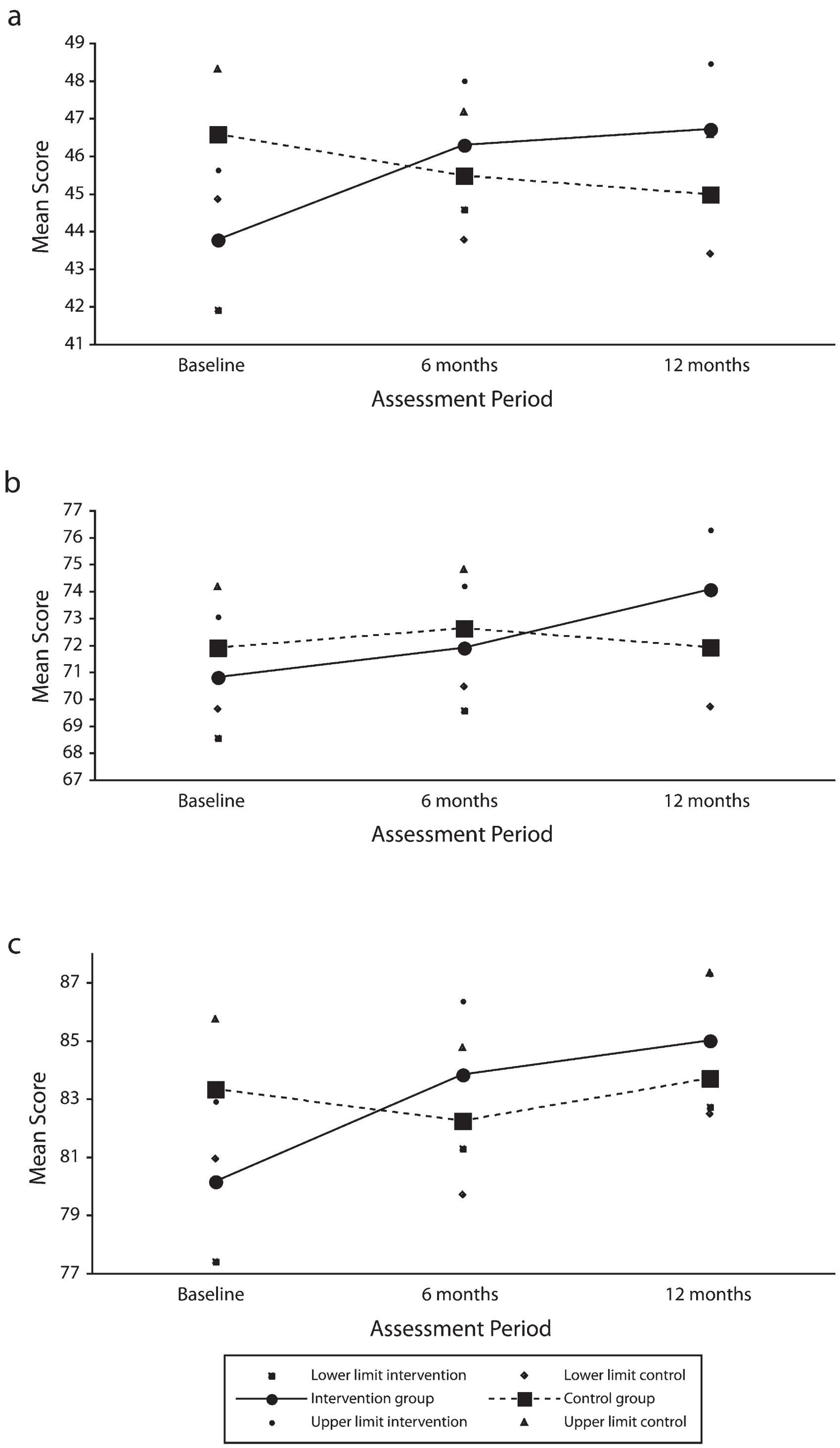

FIGURE 1—Trends in quality of life outcome measures over 12 months among participants in the intervention group and control group, by (a) trends in general health, (b) trends in mental health, and (c) trends in physical health: Thailand, 2007–2009.

Limitations

As with all studies, some inherent limitations should be noted. Although the randomization resulted in balanced groups, participants in the standard care condition reported slightly better perceived general health at baseline than did participants in the intervention condition. One plausible explanation could be that our randomization was based on geographic location (predetermined subdistricts) to avoid potential contamination; this could have led to an unbalanced sample as a result of chance alone. We adjusted for this baseline difference in our repeated measures analysis and found that the level of perceived general health increased significantly over the study period in the intervention condition, as compared with a decline in the standard care condition, after adjustment for baseline differences. Our scales, although validated in pilot studies conducted before this main trial, are prone to potential biases associated with self-reported data.

Another limitation pertains to how we measured depression. When we examined the impact of the intervention on depressive symptomatology over 12 months, we found that depressive symptoms declined more among the intervention group than among the control group. However, this difference was not statistically significant. The reason could be that we assessed depressive symptomatology rather than clinical depression. Therefore, our findings may not be generalizable to people living with HIV who are clinically depressed.

Conclusions

Despite these limitations, our results have important implications for future intervention and treatment programs targeting people living with HIV. Our findings underscore the importance of applying a participatory approach to the development and implementation of intervention programs. This process can be used in future interventions addressing specific stressors by tailoring these interventions to particular target groups. Given the need to expand mental health interventions as part of HIV-related efforts,[41] it is encouraging to see that the quality of life of people living with HIV can be improved through a behavioral intervention.

Program developers, clinicians, and policymakers should pay close attention to mental health challenges, coping skills, and family and social support levels among people living with HIV while simultaneously being aware of HIV-related stigma and discrimination in their community. Both social and psychological components should be integrated and incorporated into programs. Advances in the understanding of family functioning and the quality of life of people living with HIV suggest that program developers and researchers should address the connection between individual and family well-being. An intervention that helps people living with HIV can strengthen the family as a unit, and strengthening family resiliency can in turn have a positive impact on people living with this disease. ■

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Contributors

L. Li contributed to the origination and design of the study and led the study implementation and the writing of the article. S.-J. Lee contributed to the summarization and interpretation of study results and the data analysis. M.J. Rotheram-Borus contributed to the origination and design of the study and the interpretation of the study results. C. Jiraphongsa, S. Khumtong, S. Iamsirithaworn, and P. Thammawijaya contributed to the data collection activities in Thailand and to the interpretation of the study results.

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Human Participant Protection

This study was approved by the institutional review boards of the University of California, Los Angeles, and the Thailand Ministry of Public Health. Participants provided written informed consent.

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