

CHAPTER 3

Psychological Treatments for Depression and Anxiety Disorders in Low- and Middle-income Countries: A Meta-Analysis

Published:

van 't Hof E, Cuijpers P, Waheed W, Stein DJ (2011). Psychological treatments for depression and anxiety disorders in low- and middle-income countries: A meta-analysis. *African Journal of Psychiatry*, 14(3):200-7.



ABSTRACT

Objective: Despite increasing evidence of the contribution of depression and anxiety disorders to the global burden of disease, most literature on the efficacy of psychological treatments of these conditions focuses on studies in high-income countries. This may contribute to difficulty in convincing policy-makers in LAMIC countries to devote more resources to this area. The objective of this study is to determine the efficacy of psychological treatments for depression and anxiety disorders in low- and middle-income countries (LAMIC).

Design: Meta-analysis of randomized controlled trials on psychological treatment of depression and anxiety disorders in low-and middle-income countries.

Data sources: An existing database (www.evidencebasedpsychotherapies.org), PubMed, Embase, Psycinfo, Dissertation Abstracts International and the Cochrane Central Register of Controlled Trials were searched for studies published in all languages. Additional studies were identified from reference lists of found studies.

Eligibility criteria for selecting studies: Randomized controlled trials in which a psychological intervention for anxiety or depression was compared to a control condition (care-as-usual, waiting list, placebo, or another control group) were included. The randomized controlled trials needed to be conducted in a LAMIC country (classification of LAMIC countries according to the World Bank's list of economies) to be eligible for inclusion in the meta-analysis. Psychological treatments were defined as interventions in which the core element of treatment consisted of verbal communication between a therapist and a patient.

Methods: For each comparison between a psychological treatment and a control group, we calculated the standardized mean difference (*Cohen's d*) indicating the difference between the two groups at post-test. A random-effects meta-analysis was run to obtain summary effect estimates for the clinical outcomes. Statistical heterogeneity across trials was assessed with the I^2 statistics. Subgroup analyses were conducted using a mixed effects model.

Results: Seventeen studies met our inclusion criteria, with a total of 3,010 participants. The mean standardized difference between the treatment and control groups at post-test was

1.02 (95% CI: 0.76~1.28) which corresponds well with the effects found in high-income countries.

Conclusion: These results indicate that psychological treatments of depression and anxiety disorders are also effective in LAMIC countries, and may encourage global dissemination of these interventions.

INTRODUCTION

Depression and anxiety disorders are highly prevalent world-wide (1). On a global scale, approximately 150 million people suffer from a major depressive disorder at any moment, and almost a million commit suicide each year (2). These common mental disorders are associated with a significantly impaired quality of life (3-5), with excess mortality (6), substantial societal costs (7;8), and a considerable burden of disease. Major depression was ranked as the fourth most disabling medical disorder worldwide in 1990 (9) and 2002 (10), and is expected to be the second most disabling disorder after HIV/AIDS in 2030 (11).

Despite the high worldwide prevalence and associated burden of common mental disorders, the need for treatment is not always met (12;13). The World Health Organization (WHO) indicates that the treatment gap for mental disorders in developed countries is 30-50% and in low- and middle-income countries (LAMIC) 76-80%. This gap is mainly caused by a scarcity of human, mental health and financial resources, as a result of financial and policy factors in low- and middle-income countries. The inequity in access to mental health care that is prevalent in most low- and middle-income countries is an important factor as well. The socio-economic status of an individual determines whether he or she has access to facilities or not. The high prevalence of stigma and discrimination causes people to abstain from seeking help even if they do have access (14).

Most LAMIC countries give low priority to mental health policies, with two-thirds of these countries having no mental health policy at all (2). Around a third of countries do not have a mental health budget and of those who do have a designated budget, 21% spend less than 1 % of their total health budget on mental health (15). Research has indicated that many people who are seeking help in LAMIC countries are not treated with evidence based interventions (16). One reason for this is that many of the countries with an allocated budget are not informed by research evidence on mental health needs and efficacious treatments within the countries. This can cause policies to emphasize on specific service delivery programs for which no success is demonstrated. Therefore, most of the low- and middle-income countries do not allocate adequate resources and are ill- equipped to deal with mental health needs (17). The scarcity of useful research on the connection between

resources consumed and outcomes achieved makes it often mentioned as a barrier to convince LAMIC countries to invest in mental health care.

The evidence indicating adequate treatments for anxiety and depression, is mostly obtained from studies in high-income countries, and this may contribute to difficulty in convincing policy-makers in LAMIC countries to devote more resources to this area. While more than 85% of the world's population lives in LAMIC countries (18), only 6% of the mental health publications (dating from 1992-2001) focus on LAMIC countries (19). Between 2002 and 2004 only 3.7 % of published papers emerged from low- and middle-income countries (20). Furthermore, there are several possible reasons why data on psychotherapy from high-income countries may not be generalisable to LAMIC. First, cultural factors can influence the risks factors for common mental disorders as well as the conceptualization of these disorders by both patient and care provider. The attitudes of people in developed and developing countries often differ regarding the kind of help that is needed to resolve a disorder (21). Explanatory models in many low- and middle-income countries may be less likely to acknowledge the role of psychobiological factors in psychological distress. This may affect the attitudes of people with regard to what kind of help is needed and the acceptability of mental health interventions. Secondly, the infrastructure of health systems in high-income and LAMIC countries can diverge extensively. The applicability of treatment research from developed to LAMIC countries can be influenced by the scarcity of mental health manpower, the growth of the private medical sector, and the rising health costs and changing health care financing systems (21).

An important type of treatment that may be useful in reducing the disease burden of depression and anxiety disorders in LAMIC countries, are psychological treatments. These treatments have been well-studied in high-income countries and a considerable number of well-designed studies have shown that these interventions are effective in the treatment of common mental disorders (22-24). Furthermore, most patients in high-income countries prefer psychological treatments above pharmacotherapy for depression (25). It is not clear, however, whether these treatments are also effective in LAMIC countries.

In the current review, we present the results of a meta-analysis of psychological treatments for anxiety and depression in LAMIC countries. Although some traditional reviews have been published (26;27), no meta-analytic study has been conducted yet.

METHODS

Search strategy and selection of studies

Studies were identified using several methods. First, we used a large database of studies on the psychological treatments of depression. This database, how it was developed and the methods used, have been described in detail elsewhere (23). Key materials, overviews of the goals and mission, and an overview of all other meta-analyses which have used this database can be downloaded from the website for this project (www.evidencebasedpsychotherapies.org). In brief, the database was developed through a comprehensive literature search (of works dating from 1966 to January 2009) in which we examined a total of 9,961 abstracts in: Psycinfo (2,439), Pubmed (1,629 abstracts), Embase (2,606), the Cochrane Central Register of Controlled Trials (2,337), and in order to identify unpublished studies, Dissertation Abstracts International (950 abstracts). We identified these abstracts by combining terms indicative of psychological treatment and depression. For this database, we also collected the primary studies from 42 earlier meta-analyses of psychological treatments for depression (28) and checked the references of included studies. We retrieved a total of 1,036 papers, chapters and dissertations for further study. These documents were studied, and we selected the ones that met our inclusion criteria.

Second, we conducted an additional literature search in different databases. In total 448 abstracts were examined in Psychinfo (49), Pubmed (106), Embase (281) and Cochrane's Central Register of Controlled Trails (12). Databases were searched by combining terms indicative of controlled trial, target problems (depression and each of the anxiety disorders), country (Low- and middle-income country, LAMIC, developing country, all the specific LAMIC countries are used as key word as well) and psychological treatment. Both keywords and text words were used for all the searches. We also checked the included studies in earlier reviews (26;27). Furthermore, we checked the reference lists of included studies.

Studies were included if they met the following criteria: (1) randomized controlled trial in which a psychological intervention was compared to a control condition (care-as-usual, waiting list, placebo, or another control group); (2) the treatment was aimed at patients with depression, anxiety or both; and (3) the study was conducted in a LAMIC country (classification of LAMIC countries according to the World Bank's list of economies (29)).

Psychological treatments were defined as interventions in which the core element of treatment consisted of verbal communication between a therapist and a patient. Studies in which the psychological intervention could not be discerned from other elements of the intervention were excluded (such as managed care interventions and disease management programs), and studies on inpatients. We also excluded studies aimed at maintenance treatments and relapse prevention. Comorbid general medical or psychiatric disorders were not used as an exclusion criterion. No language restrictions were applied. Two authors extracted data on the year of publication, geographic region of the study, target disorder, study design, population characteristics, number of patients in each treatment group, type of intervention used and clinical outcome measures from each study.

We assessed the validity of included studies using the "risk of bias assessment tool", developed by the Cochrane Collaboration (30), which focused on whether the allocation sequence was generated adequately, allocation concealment, whether knowledge of the allocated interventions was adequately prevented during the study, the addressing of incomplete outcome data, whether the reports of the study are free of suggestion of selective outcome reporting, and other risks of bias.

Meta-analyses

For each comparison between a psychological treatment and a control group, we calculated the standardized mean difference (*Cohen's d*) indicating the difference between the two groups at post-test. We calculated these effect sizes by subtracting (at post-test) the average score of the psychotherapy group from the average score of the control group, and dividing the result by the pooled standard deviations of the two groups. Effect sizes of 0.8

can be assumed to be large, while effect sizes of 0.5 are moderate, and effect sizes of 0.2 are considered small (31). We applied the correction for small sample size as suggested by Hedges and Olkin (32). In the calculations of effect sizes we only used those instruments that explicitly measured symptoms of depression or anxiety. If more than one depression or anxiety measure was used, the mean of the effect sizes was calculated, so that each study (or contrast group) only provided one effect size. We only used the effect sizes indicating the differences between the psychological treatment and the control groups at post-test. We decided not to examine the effects at follow-up, because the number of effect sizes was relatively low (6 studies). In addition, the follow-up period differed considerably among these studies (ranging from 3 months to one year).

To calculate pooled mean effect sizes, we used the computer program Comprehensive Meta-Analysis (version 2.2.021). Because we expected considerable heterogeneity among the studies, we decided to calculate mean effect sizes with the random effects model. In the random effects model it is assumed that the included studies are drawn from 'populations' of studies that differ from each other systematically (heterogeneity). In this model, the effect sizes resulting from included studies not only differ because of the random error within studies, but also because of true variation in effect size from one study to the next. Publication bias was tested by using Duval and Tweedie's trim and fill procedure (33), which yields an estimate of the effect size after the publication bias has been taken into account. As an indicator of homogeneity, we calculated the I^2 -statistic which is an indicator of heterogeneity in percentages. A value of 0% indicates no observed heterogeneity, and larger values show increasing heterogeneity, with 25% as low, 50% as moderate, and 75% as high heterogeneity (34). We also calculated the Q-statistic, but only report whether this was significant or not. Because the effect size is difficult to interpret from a clinical perspective we also calculated the numbers-needed-to-be-treated (NNT), according to the formulae provided by Kraemer & Kupfer in 2006 (35). The NNT is the number of persons that have to be treated in order to generate one more positive outcome than in the control group. Subgroup analyses were conducted according to the mixed effect model. In this model, studies within subgroups are pooled with the random effects model, while tests for significant differences between subgroups are conducted with the fixed effects model.

RESULTS

Description of included trials

Seventeen trials met our inclusion criteria, with a total of 3,010 participants (36-51) (1,538 in the psychological treatment groups, 1,322 in the control groups, and 150 in the alternative treatment groups). Selected characteristics of the included trials are presented in Table 1.

Five trials compared a psychological treatment with a care-as-usual control group, while another nine trials used a waiting list control group. The remaining three trials used another type of control group (enhanced routine care, pill placebo, psychological placebo). Seven trials were focused on depressed patients, eight on patients with an anxiety disorder (four on post traumatic stress disorder, two on social phobia, one on panic and one on OCD), while two trials were focused on patients with depression or anxiety. In twelve trials, the presence of the mental disorder was established with a diagnostic interview, while in the remaining five trials patients were included on the basis of a high score on a rating scale.

Of the 22 psychological treatments that were examined in the included trials, 15 could be characterized as cognitive behaviour therapy (CBT) or a strongly related procedure (such as exposure). The remaining seven therapies examined other types of psychotherapy (counselling, interpersonal psychotherapy, psychodynamic psychotherapy). Ten of the 22 therapies were group therapies, while the remaining 12 therapies were administered individually. The number of treatment sessions ranged from 1 to 16.

Four trials were conducted each in Brazil and Uganda, two each in Turkey, Pakistan, China and one each in Cambodia, India and Iran. Eight trials were from low-income countries (Pakistan, India, Uganda and Cambodia), three from low-middle income countries (Iran and China) and six from upper-middle income countries (Turkey and Brazil). All trials were published after the year 2000.

Table 1. Characteristics of selected randomized controlled trials examining the effects of psychological intervention for depression or anxiety in LAMIC countries

<i>Study</i>	<i>Country</i>	<i>Disorder¹</i>	<i>Diagnosis</i>	<i>Population</i>	<i>Conditions²</i>	<i>Np³</i>	<i>Ns⁴</i>	<i>Format⁵</i>	<i>Intervention</i>	<i>Therapist</i>	<i>Instruments⁶</i>	<i>ITT⁷</i>	<i>ITT analyse⁸</i>
Ali, 2003	Pakistan	Depression or anxiety	No	women from middle class semi-urban community	1. Counselling 2. CAU	70 91	8	I	Supportive, problem solving and CBT techniques	Locally trained counsellors	AKUADS	-	-
Başoğlu, 2005	Turkey	PTSD	Yes	participants in mental health care delivery program	1. 1-session CBT 2. Waiting list	31 28	1	I	CBT limited to explaining of treatment rationale	Psychologists	CAPS	+	+
Bolton, 2003	Uganda	Depression	Yes	inhabitants recruited from villages	1. IPT 2. CAU	107 117	16	G	Group IPT adapted to local context	Trained local facilitators	HCSL	+	+
Bolton, 2007	Uganda	Depression	No	adolescents in camps for internally displaced people	1. IPT 2. Waiting list	82 90	16	G	Group IPT adapted to local context	Trained local facilitators	APAI depression scale	+	+
Cordioli, 2003	Brazil	OCD	Yes	OCD patients in outpatient clinic	1. CBT 2. Waiting list	10 11	12	G	Psycho-education, ERP, cognitive restructuring	Therapists with CBT experience	YBOCS HDRS, HARS	+	+
D'El Rey, 2007	Brazil	Social phobia	Yes	patients diagnosed with social phobia	1. CBT 2. Waiting list	15 16	12	G	Exposure and cognitive restructuring	Psycho-therapists	BAI		
Faramarzi, 2007	Iran	Depression	No	Women at Infertility Centre	1. CBT 2. CAU	29 30	10	G	Relaxation, cognitive restructuring	Psychologist trained for CBT program	BDI, CAI	-	-
Hamamci, 2006	Turkey	Depression	No	University students	1. Psychodrama + CBT 2. CBT 3. Waiting list	8 8 11	11	G	1. Psychodrama + CR 2. Cognitive restructuring (CR)	Therapist trained in CBT and psychodrama	BDI	-	-
Hinton, 2005	Cambodia	PTSD	Yes	Cambodian refugees in community outpatient clinic	1. CBT 2. Waiting list	20 20	12	I	Psycho-education, relaxation, cognitive restructuring, exposure	Psychiatrist	CAPS, PASS (N+O), FSS (N+O)	+	+
Ito, 2001	Brazil	Panic with agoraphobia	Yes	Patients in outpatient clinic	1. Exposure, ext. cues 2. Exposure, int. cues 3. Exposure, combined	21 20 21 18	7	I	Exposure with 1. external cues 2. interoceptive cues 3. combined	Psychiatrists and psychologist	PTF, HAM-A, SR Panic, FQ-A	-	-

Knijnik, 2004	Brazil	Generalized social phobia	Yes	Patients in outpatients clinic	4. Waiting list 1. Psychodynamic therapy 2. Psychol. placebo	15 15	12	G	Psychodynamic group treatment	Psychiatrist / psycho-therapist	LSAS, HAM-A	-	-
Neuner, 2004	Uganda	PTSD	Yes	patients in rural village northern Uganda	1. Narrative exposure 2. Counselling 3. CAU	17 14 12	4	I	1. NET based on CBT and testimony therapy 2. Nondirective counselling	Local doctoral-level psychologist + graduate students	PSDS	-	+
Neuner, 2008	Uganda	PTSD	Yes	Rwandan and Somalian refugees	1. Narrative exposure 2. Trauma counselling 3. CAU	111 111 55	6	I	1. NET based on CBT and testimony therapy 2. Nondirective counselling	Trained lay counsellors	PSDS	+	+
Patel, 2003	India	Common mental disorders	No	Outpatient clinic	1. Psychotherapy 2. Fluoxetine 3. Pill placebo	150 150 150	6	I	Psycho-education; relaxation; problem-solving; treatment for specific symptoms	Experienced therapist	CISR	-	+
Rahman, 2008	Pakistan	Major depression	Yes	Pregnant women	1. CBT 2. Enhanced routine care	463 440	16	I	Thinking Healthy Program, based on CBT principles	Primary health workers	HAM-D	-	+
Wong, 2008 A	China	Depression	Yes	Patients from outpatient centre and community referrals	1. CBT 2. Waiting list	48 48	10	G	CBT with focus on understanding responses and developing healthy cognitive and behavioural responses	Experienced mental health social workers	BDI	-	+
Wong, 2008 B	China	Depression	Yes	Patients from outpatient centre and community referrals	1. CBT 2. Waiting list	167 170	10	G	Cognitive restructuring, behavioral activation, coping skills training	Experienced mental health social workers	BDI	-	+

Abbreviations: ¹ PTSD=Post Traumatic Stress Disorder; OCD= Obsessive Compulsive Disorder; ² CAU= Care As Usual; CBT=Cognitive Behavioural Therapy; IPT= Interpersonal Therapy; ³ Np= Number of participants; ⁴ Ns= Number of sessions ; ⁵ I=Individual, G=Group; ⁶ AKUADS= Aga Khan University Anxiety and Depression Scale (AKUADS); APAI= Acholi Psychosocial Assessment Instrument; BAI= Beck Anxiety Inventory; BDI= Beck Depression Inventory; BDQ= Brief disability questionnaire; CAPS= Clinician-Administered PTSD Scale; C-BDI= Chinese Beck Depression Inventory; CISR= Revised Clinical Interview Schedule; DSRC= Depression Self-Rating Scale; FSS= Flashback Severity Scale; FQ-A= Fear Questionnaire; Agoraphobic Avoidance; HAM-A= Hamilton Anxiety Scale; HAM-D=Hamilton Depression Scale = HARS= Hamilton Anxiety Rating Scale; HCSL= Hopkins Symptom Checklist;; HDRS= Hamilton Depression Rating Scale; LSAS=Liebowitz Social Anxiety Scale; PASS= Panic Attack Severity Scale; PSDS= Posttraumatic Stress Diagnostic Scale; SR-P= Self Rating Panic; SRQ= Self-Report Questionnaire; YBOCS= Yale-Brown Obsessive-Compulsive Scale; ⁷ ITTd= d based on ITT sample; ⁸ ITT analyses executed

Table 2. Results of meta-analyses examining the efficacy of psychotherapy for adult depression and anxiety in low- and middle income countries

	N_{comp}	d	95% CI	Z	I^2 ^{a)}	p ^{b)}	NNT
All studies	22	1.02	0.76~1.28	7.60 ***	88.14 ***		1.89
One ES per study (highest)	17	0.96	0.68~1.25	6.65 ***	89.20 ***		1.99
One ES per study (lowest)	17	0.95	0.66~1.23	6.55 ***	89.17 ***		2.10
Adjusted for publication bias (N imputed studies: 7)		0.59	0.29~0.88				3.09
<u>Subgroup analyses</u> ^{c)}							
Disorder							
- Depression	8	1.07	0.71~1.43	5.80 ***	89.26 ***	<u>0.053</u>	1.82
- Anxiety	12	1.15	0.66~1.64	4.59 ***	84.09 ***		1.71
- Mixed	2	0.31	-0.27~0.88	1.04 n.s.	87.89		5.75
DSM diagnosis							
- Yes	16	1.09	0.77~1.41	6.67 ***	87.76 ***	0.388	1.79
- No	6	0.84	0.36~1.31	3.46 **	86.90 ***		2.23
Therapy							
- CBT	15	1.25	0.94~1.55	7.99 ***	82.98 ***	<u>0.032</u>	1.60
- Other	7	0.57	0.03~1.11	2.06 *	93.26 ***		3.18
Format							
- Individual	12	0.95	0.59~1.31	5.19 ***	87.90 ***	0.568	2.01
- Group	10	1.10	0.71~1.50	5.51 ***	86.24 ***		1.77
Control group							
- Waiting list	12	1.37	1.00~1.74	7.23 ***	82.25 ***	<u>0.002</u>	1.50
- Care-as-usual	7	0.86	0.31~1.40	3.07 **	88.79 ***		2.19
- Other	3	0.23	-0.28~0.73	0.87 n.s.	90.01 ***		7.69
d based on ITT sample							
- Yes	7	1.11	0.57~1.65	4.05 ***	89.78 ***	0.638	1.76
- No	15	0.97	0.66~1.27	6.30 ***	86.17 ***		1.97
Risk of bias							
- Low	15	1.16	0.82~1.50	6.64 ***	83.60 ***	0.213	1.70
- Other studies	7	0.79	0.31~1.26	3.26 **	93.04 ***		2.36
Income of country							
- Low	10	0.76	0.38~1.13	3.97 ***	91.58 ***	0.173	2.44
- Lower-middle	3	1.02	0.51~1.52	3.93 ***	78.99 **		1.89
- Higher-middle	9	1.39	0.84~1.95	4.92 ***	79.69 ***		1.48

* $p < .05$; ** $p < .01$; *** $p < .001$.

Abbreviations: ES: effect size; CI: confidence interval; ITT: intention-to-treat; N_{comp} : Number of comparisons; NNT: numbers-needed-to-be-treated.

^{a)} The p-values in this column indicate whether the Q-statistic is significant (the I^2 statistics does not include a test of significance).

^{b)} The p-values in this column indicate whether the difference between the effect sizes in the subgroups is significant.

^{c)} All subgroup analyses were conducted with mixed effects analyse

Quality assessment

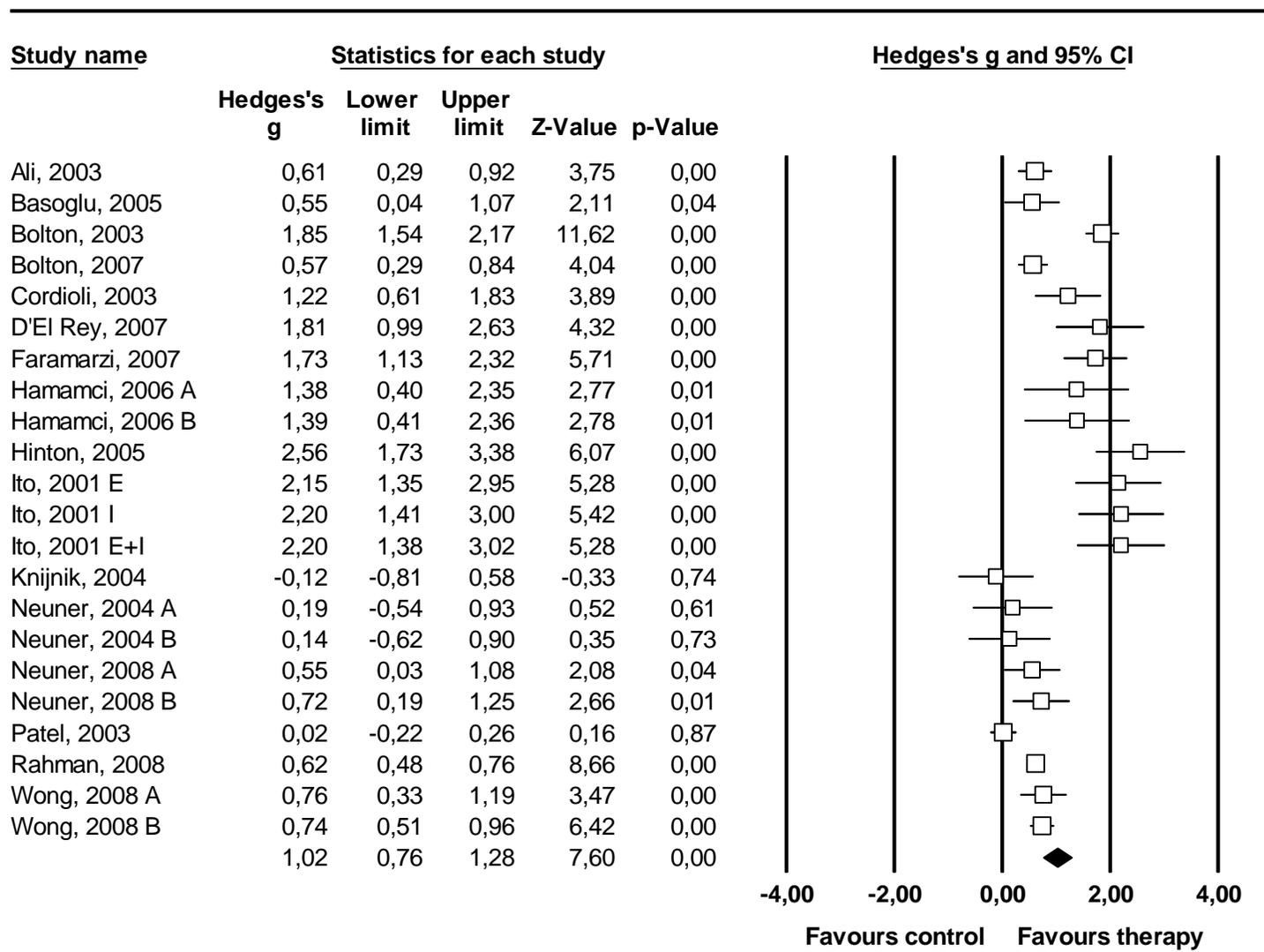
We found that 10 of the 17 trials used an adequate allocation sequence in the randomization process, and 7 trials met criteria for adequate allocation concealment, although true allocation concealment to patients is not possible in trials in which patients are randomized to a treatment or a care-as-usual control group or a waiting list group. In 15 trials the outcome assessors were adequately blinded (blinding of patients was usually not possible), or only self-report measures were used (in which blinding of assessors is not relevant). In 12 trials incomplete outcome data were addressed adequately. We had no indication that in any of the trials selective outcome reporting was a problem, nor did we find other risks of bias in any of the trials. Five of the 17 trials were positive on all six criteria.

Effects of psychological treatments at post-test

We were able to examine the difference between a psychological treatment and a control group in 22 comparisons. The mean effect size was 1.02 (95% CI: 0.76~1.28), which corresponds with an NNT of 1.89. Heterogeneity was very high ($I^2=88.14$) and statistically significant ($p<0.001$). The results of these analyses are summarized in Table 2. The effect sizes and 95% confidence intervals of the individual contrast groups are plotted in Figure 1.

In our analyses, we included four trials in which two psychological treatments were compared to the same control group. This means that multiple comparisons from this study were included in the same analysis. These multiple comparisons, however, are not independent of each other, which may have resulted in an artificial reduction of heterogeneity and a distortion of the mean effect size. Therefore, we conducted another meta-analysis, in which we included only one comparison per study (Table 2). From the study with multiple comparisons we first included only the comparison with the largest effect size. Then we conducted another meta-analysis in which we included only the smallest effect size from the two trials. As can be seen in Table 2, these analyses did not indicate that the mean effect size changed considerably, nor did we find indications that heterogeneity was affected by this study.

Figure 1. Differences between psychological treatments and control groups at post-test in low- and middle-income countries: Hedges'g



Both the funnel plot and Duval and Tweedie's (33) trim and fill procedure pointed to the possibility of significant publication bias. Adjustment for publication bias using Duval and Tweedie's (33) trim and fill procedure resulted in a considerably smaller effect size (adjusted effect size: 0.59; 95% CI: 0.29~0.88; number of imputed trials: 7; NNT=2.10).

Subgroup analyses

We conducted a series of subgroup analyses to examine whether the effect sizes of specific groups differed from each other (Table 2). This was especially important because heterogeneity was very high in the main analyses, and subgroup analyses may give indications for the causes of this heterogeneity.

We found no indication that the effect sizes of trials in which patients were included after a diagnostic interview differed significantly from the effect size of trials in which patients were included on the basis of a high score on a self-rating instrument. We also found no significant difference between trials using individual therapy and those using group therapy, or between trials in which the effect size was based on the intention-to-treat sample and the trials in which that was not done, and between the trials in which all criteria for a low risk of bias were met and the other trials. The income of the country where the study was conducted was also not related to the effect size.

We did, however, find that trials in which CBT was used as treatment resulted in significantly higher effect sizes than trials in which other types of therapy were used. We also found that care-as-usual and waiting list control groups resulted in higher effect sizes than other control groups, although there were only three comparisons in which another type of control group was examined. There was also a trend ($p < 0.1$) indicating that trials in which depressed and anxious patients were both included resulted in a lower effect size than trials aimed at depressed patients or anxious patients, although the "mixed" category included only two trials.

DISCUSSION

Data from this meta-analysis indicate that psychological treatments of depression and anxiety disorders have promise in LAMIC countries. We found large effect sizes, which are consistent with effect sizes found in meta-analyses of studies on psychological treatments in high-income countries (23;24). This suggests that psychological treatments can be applied successfully in low- and middle-income countries and may contribute considerably to the reduction of the disease burden of common mental disorders in these countries.

We have to be careful, however, to avoid being over-optimistic about these results. First, we found very high levels of heterogeneity in our analyses, and our subgroup analyses could not give a clear explanation for this. This implies that some studies result in higher and others in lower effect sizes, and we have little understanding of the origins of these differences. This means that psychological treatments are effective in some situations but not in all, and we are not able to predict which of the two will be the case in a specific situation. Second, we found strong indications of publication bias. This suggests that our meta-analysis gives an overestimation of the true effect size of psychological treatments. However, this is also true for studies on psychological treatments conducted in high-income countries (52). Third, even if psychological treatments are efficacious in LAMIC countries, more work is needed to demonstrate their effectiveness in such settings. There may be a number of important barriers to implementing such interventions in resource-constrained contexts.

This study has several limitations that deserve emphasis. First, the number of studies was relatively small. Second, they were conducted in several different countries and cultures, therefore there is limited data from any particular country or culture. Perhaps this can explain in part the high level of heterogeneity in the analyses. Third, several of the included studies had a considerable risk of bias, which may also be responsible for a part of the heterogeneity.

We found indications that cognitive behaviour therapy is more effective than other psychological treatments. It is well-known that cognitive behaviour therapy is an efficacious treatment for many mental disorders, and it may not come as a surprise that we found it to be

superior to other therapies. However, in a previous study, we found few indications that cognitive behaviour therapy is more efficacious than other psychotherapies in the treatment of adult depression (23). Furthermore, in the current meta-analysis, heterogeneity was very high in both subgroups (cognitive behaviour therapies and the other psychotherapies), suggesting that the difference in effect sizes in these two groups were not related to type of therapy, but rather to some other underlying factor which was not examined in our study.

We also found that type of control group was related to the effect size. It is well-known from many studies that waiting list control groups result in much larger effect sizes than care-as-usual control groups, which in turn result in larger effect sizes than placebo control groups (pill placebo or psychological placebo)(53). Apparently, this is not different in psychotherapies conducted in LAMIC countries. Studies evaluating treatments aimed at either depression or anxiety revealed significantly higher effect sizes than the two studies looking at both depression and anxiety. This may be an indication of the importance of using specific evidence-based treatments for distinct mental health problems.

Individual and group interventions appear to be equally efficacious in our meta-analysis. This is consistent with literature indicating group interventions to be as efficacious as individual treatments for anxiety and depression (22;54). A recent meta-analysis conducted on efficacy studies for depression did find a small difference favouring individual treatments in the short term (55), but indicated that due to a small numbers of studies with limited quality this should be examined more thoroughly. Individual treatments are generally considered more time-consuming and costly and at first sight not ideal for low-income under-resourced countries. There is relatively limited data on cost-effectiveness of individual versus group treatments, but group treatments may be more cost effective in treating depression, and less cost effective in treating anxiety disorders (56). In some low- and middle-income countries group intervention may be desirable as an extension of traditional sociological structures, but again more effectiveness research is needed in this area.

The results of the included studies indicate that the use of lay counsellors and primary health workers may be helpful in filling the treatment gap in under-resourced contexts.

Research studies have used lay counsellors to conduct interventions (38;39;48;51;), indicating that psychological interventions carried out by lay counsellors with limited training may be efficacious. Task-shifting at primary health settings may be a way to increase mental health services offered to communities (57;58). The mobilization of community resources is proposed in a report by the World Health Organization together with ideas of integrating mental health services into existing primary care services to cope with the under-resourced situation (59).

The common misconception of a lack of psychological mindedness in developing countries is negated by the positive results for psychological treatments in this meta-analysis. The current meta-analysis may therefore help to encourage additional research on psychological treatments in LAMIC countries. The World Health Organization has called for an increased investment in mental health research in particularly low- and middle-income countries (17). Evidence-based research can reinforce the commitment of policymakers and provide a concrete evidence based programme for scaling up care for mental disorders. There is a need for rigorous effectiveness studies focussing on the feasibility and acceptability of interventions in LAMIC countries, as well as on their cost-effectiveness. Evidence of the efficacy and effectiveness of psychological treatments can be used to encourage stakeholders and governments to increase the investment in mental health resources. In this way an evidence base can be created that can inform the scaling-up of interventions for mental disorders in these parts of the world (19,60).

The publication dates of randomized controlled trials of psychological interventions for depression and anxiety in LAMIC countries indicates that studies in this field are expanding. Most of the studies included in this review were published between 2003 and 2008, and it is hoped that this trend will continue in the years to come. We can expect that in the coming decades a growing number of trials will be conducted to examine the efficacy and effectiveness of psychotherapies in different parts of the world, and where appropriate, the dissemination of psychological and other treatments for depression and anxiety disorders.

REFERENCE LIST

1. Kessler RC, Angermeyer M, Anthony JC, de Graaf R, Demyttenaere K, Gasquet I, DE Girolamo G, Gluzman S, Gureje O, Haro JM, Kawakami N, Karam A, Levinson D, Medina Mora ME, Oakley Browne MA, Posada-Villa J, Stein DJ, Adley Tsang CH, Aguilar-Gaxiola S, Alonso J, Lee S, Heeringa S, Pennell BE, Berglund P, Gruber MJ, Petukhova M, Chatterji S, Ustün TB. Lifetime prevalence and age-of-onset distributions of mental disorders in the World Health Organization's World Mental Health Survey Initiative. *World Psychiatry* 2007;6(3):168-176.
2. World Health Organisation. World Health Organisation (2005) Atlas: mental health resources in the world 2005. Geneva: World Health Organization; 2005.
3. Ustün TB, Ayuso-Mateos JL, Chatterji S, Mathers C, Murray CJL. Global burden of depressive disorders in the year 2000. *British Journal of Psychiatry* 2004;184:386-92.
4. Mendlowicz MV, Stein MB. Quality of life in individuals with anxiety disorders. *American Journal of Psychiatry* 2000;157:669-82.
5. Saarni SI, Suvisaari J, Sintonen H, Pirkola S, Koskinen S, Aromaa A, Lönnqvist J. Impact of psychiatric disorders on health-related quality of life: general population survey. *British Journal of Psychiatry* 2007;190:326-32.
6. Cuijpers P, Smit F. Excess mortality in depression: a meta-analysis of community studies. *Journal of Affective Disorders* 2002;72:227-36.
7. Smit F, Cuijpers P, Oostenbrink J, Batelaan N, De Graaf R, Beekman A. Excess costs of common mental disorders: population-based cohort study. *Journal of Mental Health Policy and Economics* 2006;(9):193-200.
8. Berto P, D'Ilario D, Ruffo P, Di Virgilio D, Rizzo F. Depression: cost-of- illness studies in the international literature, a review. *Journal of Mental Health Policy and Economics* 2000;3:3-10.
9. Murray CJ, Lopez AD. Evidence-based health policy—lessons from the Global Burden of Disease Study. *Science* 1996;274:740-3.
10. Mathers CD, Loncar D. Projections of global mortality and burden of disease from 2002 to 2030. *PLoS Med* 2006;3(11):e442.
11. Lopez AD, Mathers CD. Measuring the global burden of disease and epidemiological transitions: 2002-2030. *Annals of Tropical Medicine and Parasitology* 2006;100(5-6):481-99.
12. Demyttenaere K, Bruffaerts R, Posada-Villa J, Gasquet I, Kovess V, Lepine JP, Angermeyer MC, Bernert S, de Girolamo G, Morosini P, Polidori G, Kikkawa T, Kawakami N, Ono Y, Takeshima T, Uda H, Karam EG, Fayyad JA, Karam AN, Mneimneh ZN, Medina-Mora ME, Borges G, Lara C, de Graaf R, Ormel J, Gureje O, Shen Y, Huang Y, Zhang M, Alonso J, Haro JM, Vilagut G, Bromet EJ, Gluzman S, Webb C, Kessler RC, Merikangas KR, Anthony JC, Von Korff MR, Wang PS, Brugha TS, Aguilar-Gaxiola S, Lee S, Heeringa S, Pennell BE, Zaslavsky AM, Ustun TB, Chatterji S. Prevalence, severity, and unmet treatment for mental disorders in the World Health Organization World Mental Health Surveys. *JAMA* 2004;291(21):2581-90.
13. Wang PS, Angermeyer M, Borges G, Bruffaerts R, Tat Chiu W, De Girolamo G, Fayyad J, Gureje O, Haro JM, Huang Y, Kessler RC, Kovess V, Levinson D, Nakane Y, Oakley Brown MA, Ormel JH, Posada-Villa J, Aguilar-

- Gaxiola S, Alonso J, Lee S, Heeringa S, Pennell BE, Chatterji S, Ustün TB. Delay and failure in treatment seeking after first onset of mental disorders in the World Health Organization's World Mental Health Survey Initiative. *World Psychiatry* 2007;6(3):177-85.
14. Saxena S, Thornicroft G, Knapp M, Whiteford H. Resources for mental health: scarcity, inequity, and inefficiency. *The Lancet* 2007;370:878-89.
 15. World Health Organisation. mhGAP:Mental Health Gap Action Programme: scaling up care for mental, neurological and substance use disorders. 2008.
 16. Saxena S, Thornicroft G, Knapp M, Whiteford H. Resources for mental health: scarcity, inequity, and inefficiency. *The Lancet* 2007;370:878-89.
 17. World Health Organisation. Investing in Mental Health. Geneva: WHO; 2003.
 18. World Bank. 2007 World Development Indicators. 2007.
 19. Saxena S, Paraje G, Sharan P, Karam G, Sadana R. The 10/90 divide in mental health research: trends over a 10-year period. *British Journal of Psychiatry* 2006;188:81-2.
 20. Patel V, Kim YR. Contribution of low- and middle-income countries to research published in leading general psychiatry journals, 2002-2004. *British Journal of Psychiatry* 2007;190:77-8.
 21. Patel V. The need for treatment evidence for common mental disorders in developing countries. *Psychological Medicine* 2000;30:743-6.
 22. Acaturk C, Cuijpers P, van Straten A, de Graaf R. Psychological treatment of social anxiety disorder: a meta-analysis. *Psychological Medicine* 2008;28:1-14.
 23. Cuijpers P, van Straten A, Warmerdam L, Smit N. Characteristics of effective psychological treatments of depression: a metaregression analysis. *Psychotherapy Research* 2008;18(2):225-36.
 24. Churchill R, Hunot V, Corney R, Knapp M, McGuire H, Wessely S. A systematic review of controlled trials of the effectiveness and cost-effectiveness of brief psychological treatments for depression. *Health Technology Assessment* 2001;5(35):1-173.
 25. van Schaik DJ, Klijn AF, van Hout HP, van Marwijk HW, Beekman AT, de Haan M, et al. Patients' preferences in the treatment of depressive disorder in primary care. *General Hospital Psychiatry* 2004;26(3):184-9.
 26. Ventevogel P, de Jong JTVM. De effectiviteit van de geestelijke gezondheidszorg in ontwikkelingslanden. *Tijdschrift voor Psychiatrie* 2006;48:283-93.
 27. Patel V, Araya R, Chatterji S, Christholm D, Cohen A, De Silva M, Hosman C, McGuire H, Rojas G, van Ommeren M. Treatment and prevention of mental disorders in low-income and middle-income countries. *The Lancet* 2007;370:991-1005.
 28. Cuijpers P, Dekker J. Psychologische behandeling van depressie; een systematisch overzicht van meta-analysen. *Nederlands Tijdschrift voor de Geneeskunde* 2005;(149):1892-7.
 29. World Bank. Country classification table. 2009.

30. Cochrane Handbook for Systematic Reviews of Interventions Version 5.0.1 [updated September 2008]. The Cochrane Collaboration; 2008.
31. Lipsey MW, Wilson DB. The efficacy of psychological, educational and behavioral treatment. *American Psychologist* 1993;48:1181-209.
32. Hedges LV, Olkin I. *Statistical methods for meta-analysis*. New York: Academic Press; 1985.
33. Duval S, Tweedie R. Trim and fill: A simple funnel-plot-based method of testing and adjusting for publication bias in meta-analysis. *Biometrics* 2000;56:455-63.
34. Higgins JP, Thompson SG, Deeks JJ, Altman DG. Measuring inconsistency in meta-analyses. *British Medical Journal* 2003;327:557-60.
35. Kraemer HC, Kupfer DJ. Size of treatment effects and their importance to clinical research and practice. *Biological Psychiatry* 2006;59(11):990-6.
36. Ali BS, Rahbar MH, Naeem S, Gul A, Mubeen S, Iqbal A. The effectiveness of counseling on anxiety and depression by minimally trained counselors: a randomized controlled trial. *American Journal of Psychotherapy* 2003;57(3):324-36.
37. Basoglu M, Salcioglu E, Livanou M, Kalender D, Acar G. Single-session behavioral treatment of earthquake-related posttraumatic stress disorder: a randomized waiting list controlled trial. *Journal of traumatic stress* 2005;18(1):1-11.
38. Bolton P, Bass J, Neugebauer R, Verdelli H, Clougherty K, Wickramaratne P, et al. Group interpersonal psychotherapy for depression in rural Uganda: a randomized controlled trial. *JAMA* 2003;289(3):3117-24.
39. Bolton P, Bass J, Betancourt T, Speelman L, Onyango G, Clougherty KF, Neugebauer R, Murray L, Verdelli H. Interventions for depression symptoms among adolescent survivors of war and displacement in northern Uganda: a randomized controlled trial. *JAMA* 2007;298(5):519-27.
40. Cordioli AV, Heldt E, Bochi DB, Margis R, de Sousa MB, Tonelle JF, et al. Cognitive-behavioral group therapy in obsessive-compulsive disorder: a randomized clinical trial. *Psychotherapy and psychosomatics* 2003;72:211-6.
41. D'El Rey GJF, Lacava JPL, Cejkinski A, Mello SL. Cognitive-behavioral group treatment in social phobia: 12-week outcome. *Revista de Psiquiatria Clinica* 2007;35(2):79-83.
42. Faramarzi M, Alipor A, Esmaelzadeh S, Kheirkhah F, Poladi K, Pash H. Treatment of depression and anxiety in infertile women: Cognitive behavioral therapy versus fluoxetine. *Journal of Affective Disorders* 2008;108:159-64.
43. Hamamci Z. Integrating psychodrama and cognitive behavioral therapy to treat moderate depression. *The Arts in Psychotherapy* 2006;33:199-207.
44. Hinton DE, Chhean D, Pich V, Safren SA, Hofmann SG, Pollack MH. A randomized controlled trial of cognitive-behavior therapy for Cambodian refugees with treatment-resistant PTSD and panic attacks: a cross-over design. *Journal of traumatic stress* 2005;18(6):617-29.

45. Ito LM, de Araujo LA, Tess VLC, de Barros-Neto TP, Asbahr FR, Marks I. Self-exposure therapy for panic disorder with agoraphobia: randomised controlled study of external v. interoceptive self-exposure. *British Journal of Psychiatry* 2001;178:331-6.
46. Knijnik DZ, Kapczinski F, Chachamovich E, Margis R, Eizirik CL. Psychodynamic group treatment for generalized social phobia. *Revista Brasileira de Psiquiatria* 2004;26(2):77-81.
47. Neuner F, Schauer M, Klaschik C, Karunakara U, Elbert T. A comparison of narrative exposure therapy, supportive counseling, and psychoeducation for treating posttraumatic stress disorder in an African Refugee Settlement. *Journal of Consulting and Clinical Psychology* 2004;72(4):579-87.
48. Neuner F, Onyut PL, Ertl V, Oldenwald M, Schauer E, Elbert T. Treatment of Posttraumatic Stress Disorder by trained Lay Counselors in an African Refugee Settlement: A Randomized Controlled Trial. *Journal of Consulting and Clinical Psychology* 2008;76(4):686-94.
49. Patel V, Chisholm D, Rabe-Hesketh S, Dias-Saxena F, Andrew G, Mann A. Efficacy and cost-effectiveness of drug and psychological treatments for common mental disorders in general health care in Goa, India: a randomised, controlled trial. *Lancet* 2003;361:33-9.
50. Rahman A, Malik A, Sikander S, Roberts C, Creed F. Cognitive behaviour therapy-based intervention by community health workers for mothers with depression and their infants in rural pakistan: a cluster-randomised controlled trial. *Lancet* 2008;372:902-909.
51. Wong DFK. Cognitive behavioral treatment groups for people with chronic depression in Hong Kong: a randomized wait-list control design. *Depression and Anxiety* 2008;25:142-8.
52. Cuijpers P, van Straten A, Bohlmeijer E, Hollon SD, Andersson G. The effects of psychotherapy for adult depression are overestimated: a meta-analysis of study quality and effect size. *Psychological Medicine* 2009;3:1-13.
53. Cuijpers P, van Straten A, Warmerdam L, Smits N. Characteristics of effective psychological treatments of depression: a metaregression analysis. *Psychotherapy Research* 2008;18(2):225-36.
54. McRoberts C, Burlingame GM, Hoag MJ. Comparative Efficacy of Individual and Group Psychotherapy: A Meta-Analytic Perspectiv. *Group Dynamics: Theory, Research, and Practice* 1998;2(2):101-17.
55. Cuijpers P, Van Straten A, Warmerdam L. Are individual and group treatments equally effective in the treatment of depression in adults? A meta-analysis. *The European Journal of Psychiatry* 2008;22(1):38-51.
56. Tucker M, Oei PS. Is Group More Cost Effective than Individual Cognitive Behaviour Therapy? The Evidence is not Solid Yet. *Behavioural and Cognitive Psychotherapy* 2007;35:77-91.
57. Feldman S, Bachman J, Cuffel B, Friesen B, McCabe J. Advanced practice psychiatric nurses as a treatment resource: survey and analysis. *Administration and Policy in Mental Health and Mental Health Services Research* 2003;30(6):479-94.
58. Hanrahan N, Hartley D. Employment of advanced-practice psychiatric nurses to stem rural mental health workforce shortages. *Psychiatric Services* 2008;59(1):109-11.
59. World Health Organization. The world health report 2001. Mental health: new understanding, new hope. Geneva: World Health Organization; 2001.

