Psychological Medicine (2014), **44**, 657–666. © Cambridge University Press 2013
doi:10.1017/S0033291713001141

ORIGINAL ARTICLE

Training primary health care workers in mental health and its impact on diagnoses of common mental disorders in primary care of a developing country, Malawi: a cluster-randomized controlled trial

F. Kauye[1]*, R. Jenkins[2] and A. Rahman[3]

[1] *College of Medicine, Blantyre, Malawi*
[2] *WHO Collaborating Centre, Institute of Psychiatry, King's College London, London, UK*
[3] *Department of Psychological Sciences, Institute of Psychology, Health and Society, University of Liverpool, Liverpool, UK*

Background. Mental health problems are common in primary care, with prevalence rates of up to 40% reported in developing countries. The study aim was to evaluate the impact of a specially designed toolkit used to train primary health care (PHC) workers in mental health on the rates of diagnosed cases of common mental disorders, malaria and non-specific musculoskeletal pains in primary care in Malawi.

Method. Clinics with out-patient services in the designated district were randomly divided into control and intervention arms. Using a two-phase sampling process, Self-Reporting Questionnaire scores, data on diagnoses made by PHC workers and results of the Structured Clinical Interview for DSM-IV for depression were collected from 837 consecutively attending adult patients in the pre-intervention study and 2600 patients in the post-intervention study.

Results. The point prevalence rates for probable common mental disorder and depression were 28.8% and 19%, respectively. Rates for both anxiety and depression diagnoses by PHC workers at baseline were 0% in both arms. Following training, there were significant differences between the two arms in the rates of diagnosed cases of depression [9.2% *v.* 0.5%, odds ratio (OR) 32.1, 95% confidence interval (CI) 7.4–144.3, $p \leqslant 0.001$], anxiety (1.2% *v.* 0%, $p \leqslant 0.001$) and malaria (31% *v.* 40%, OR 0.62, 95% CI 0.43–0.89, $p=0.01$). The intervention arm had more cases diagnosed with depression and anxiety while the control arm had more cases diagnosed with malaria.

Conclusions. Training of PHC workers in mental health with an appropriate toolkit will contribute significantly to the quality of detection and management of patients seen in primary care in developing countries.

Received 6 July 2012; Revised 4 April 2013; Accepted 13 April 2013; First published online 31 May 2013

Key words: Common mental disorders, malaria, non-specific musculoskeletal pains, primary health care workers, training.

Introduction

Mental disorders comprise a significant proportion of the global burden of diseases including in developing countries. Surveys of community samples show that prevalence rates of mental disorders range from about 10% to 25% (Cohen, 2001). Rates are even higher for primary care attendees, usually between 15% and 30% and in some cases reaching as high as 45% (Cohen, 2001). A study carried out at two centres in Kenya using the Self-Reporting Questionnaire (SRQ) and the Standard Psychiatric Interview found an average rate of psychiatric morbidity of 29% (Dhadphale *et al.* 1983). Anxiety and depression were the most frequent diagnostic categories. In another East African study from Tanzania exploring the prevalence of common mental disorders among attendees in a primary health clinic and patients seeking care from traditional healers, rates of 24% among primary health clinic attendees and of 48% among traditional healers' attendees were found (Ngoma *et al.* 2003). A World Health Organization (WHO) study of psychological distress in general practice performed in 15 countries found that the prevalence and detection rates of mental disorders varied widely, with an average of 24% for prevalence and 48.9% for detection rate (Goldberg & Gater, 1996). A WHO study in 2002 (Bowie, 2006) estimated that depression was the fourth leading cause of disability in Malawi, after human immunodeficiency virus (HIV), cataracts and malaria; one study from

* Address for correspondence: F. Kauye, Ph.D., College of Medicine, Blantyre, Malawi.
(Email: felixkauye@yahoo.com)

rural Malawi found the prevalence of probable common mental disorders in mothers attending postnatal clinics to be 30% (Stewart *et al.* 2008).

Despite the high prevalence of mental disorders in developing countries, there are severe shortages of mental health professionals. In contrast to developed countries where there is a specialist psychiatrist for every 10 000 to 25 000 people (Jenkins *et al.* 2010*b*), ratios for most developing countries are low, with a ratio of one specialist for 500 000 to 1 000 000 population (Ndetei, 2008). The WHO's European region has 200 times as many psychiatrists as in Africa (WHO, 2005). The shortage of health professionals is not only restricted to mental health professionals, and unlike in developed countries where primary health workers are general medical doctors, paramedics and nurses form the backbone of primary health care (PHC) in developing countries.

The Grand Challenges in Global Mental Health, which is a consortium of researchers, advocates and clinicians, identified the integration of screening and core packages of services in routine primary care as a major priority in order to improve treatments and access to care for people with mental health problems (Collins *et al.* 2011).

This paper reports a cluster-randomized controlled trial of the impact of a specially designed toolkit for training PHC workers in mental health by looking at the impact of the training package on rates of diagnosed cases of depression, anxiety and on rates of diagnosis of malaria and non-specific musculoskeletal pains in primary care in a developing country. The study is registered with ISRCTN (International Standard Randomised Controlled Trial Number; http://www.isrctn.org/).

Method

Study area and participants

The study was carried out in the sub-Saharan African country of Malawi. Its population is estimated at 13 million and the literacy rate is 69% for men and 59% for women (National Statistical Office of Malawi, 2008). Administratively, Malawi is divided into three regions which are further divided into 28 districts. The smallest health unit in Malawi is the health post, which is manned by between one and three health surveillance assistants who undergo a 10-week course in public health. This serves a small number of villages with an average population of 2000. Next to the health post in the referral hierarchy is the health centre, which is usually manned by medical assistants. Medical assistants are paramedics who undergo 2 years of training in medical sciences and graduate with a certificate in medical sciences. A health centre normally caters for a population of about 22 500 people. Problems that cannot be treated at the health centre are referred to the district hospitals which are present in all the 28 districts except three.

The sample frame was Machinga district (in the southern region of Malawi), which has a population of 459 000 people, is served by 20 health centres and has one district hospital. Of the 20 health centres, two were excluded from the study because they only offered maternity services with no general out-patient services. So, 18 health centres with general out-patient services were included in the study. The health centre was chosen as the unit of randomization and pair matching was carried out according to average daily attendance rates. Random allocation was performed by a statistician from Liverpool in the UK, who was not involved in the study and was unaware of the identity of the health centres. All 22 medical assistants working in the randomized health centres participated in the study.

The study design was repeated cross-sectional surveys where data were collected at two time points (baseline and post-intervention) on two separate samples of participants but by the same health workers.

Inclusion and exclusion criteria

Consecutive adult attendees aged 16 years and above at the health centres were recruited into the trial. Children and very ill patients were excluded from the study. These criteria were the same for both studies. Participants who took part in the baseline study were not included in the post-intervention study.

Intervention group

PHC workers in the intervention group underwent a 5-day training programme in mental health using a toolkit originally designed for Kenya where it has been used to train 2000 primary health workers. The toolkit, described in detail elsewhere (Jenkins *et al.* 2010*a*,*b*), consists of five units. Unit 1 covers core concepts of mental health and mental illness. Unit 2 covers basic psychosocial skills. Unit 3 covers common neurological disorders and the fourth unit covers psychiatric disorders whose content is based on WHO primary care guidelines for mental health (WHO UK Collaborating Centre, 2003–2004), adapted for Kenya. Unit 5 covers health sector and other sector system issues of policy; legislation; links between mental health and child health, reproductive health, HIV and malaria; roles and responsibilities; health management information systems; working with community health workers and with traditional healers and integration

https://doi.org/10.1017/S0033291713001141 Published online by Cambridge University Press

of mental health into annual operational plans. The 5-day training course is generally divided into 30-min sections, each of which contains a short lecture, group discussion and role-plays. This specially designed toolkit for Kenya was adapted and tested for use in Malawi. Changes made for Malawi included the development of treatment algorithms based on the text of the original toolkit and adaptation of the role-plays to depict Malawian situations.

The training sessions in the intervention arm were performed by the lead author (F.K.).

Control group

PHC workers in the control group underwent 3 days of training using a syllabus that has been used for a number of years to train primary health workers in mental health in Malawi. The syllabus includes lectures on different psychiatric illnesses including the psychotic illnesses, mood disorders, anxiety disorders, substance abuse and psychiatric disorders secondary to general medical conditions. The training sessions in the control arm were performed by the longest-serving psychiatric clinical officer from the national psychiatric hospital who has been practising psychiatry in Malawi for the past 15 years since 1995.

Data ascertainment

Data were collected at two time points: baseline and post-intervention. The same procedure was used to diagnose common mental disorders, malaria and non-specific musculoskeletal pains at both time points. The hypothesis was that the training in the intervention arms would lead to more patients being diagnosed with common mental disorders and reduce erroneous diagnosis of malaria and non-specific musculoskeletal pains.

Diagnosis of common mental disorder

A two-phase sampling process using the SRQ in the first phase and the Structured Clinical Interview for DSM-IV (SCID-I/NP; http://www.scid4.org/faq/scidfaq.html) for depression in the second phase was used.

The SRQ used in the study had 20 items. A cut-off of nine was used for this study because in a pilot study carried out 8 months before the main study; this was found to give a good balance in terms of sensitivity, specificity and positive predictive value in this population.

The SCID is a semi-structured interview for making most of the DSM-IV Axis I psychiatric diagnoses. It has been translated in a number of languages and has been used across cultures in at least 700 published studies. The section on Current Major Depressive episode was used for this study. The SCID for Depression was used to measure the accuracy of the diagnosis of depression made by primary health workers by calculating the diagnostic sensitivity and specificity of depression.

Both the SRQ and SCID for Depression underwent a process of validation in Malawi that included translation, back-translation, focus group discussions and testing (Stewart *et al.* 2009).

Diagnosis of malaria and non-specific musculoskeletal pains

Malaria microscopy and rapid diagnostic tests are used as the 'gold standard' to test for malaria. Since most health centres did not have laboratory facilities to confirm the diagnosis of malaria, the diagnosis of malaria was based on clinical assessments by the primary health workers. Although not the 'gold standard' for diagnosis, the presence, and/or a history, of fever is a core feature of malaria. For patients who met the criteria for SCID diagnosis of depression but were diagnosed with malaria, the research team assessed their temperature and history of fever to determine the accuracy of diagnosis of malaria.

Although non-specific musculoskeletal pains are not a diagnosis, in many developing countries like Malawi, they are a common diagnostic entity in primary care. They account for about 4% of all diagnoses made in primary care in Malawi (Ministry of Health and Population, 2003) and the diagnosis is based on clinical presentation.

Data collection procedure

For the baseline and post-intervention phases, all consecutive attendees were assessed for current major depressive episode using the procedures described. All consecutive attendees who gave informed written consent were screened with the SRQ at the time of registration. After screening they were assessed by the medical assistant and received a clinical diagnosis. After seeing the medical assistant and before they left the clinic, all high scorers on the SRQ and a proportion of low scorers were assessed by the research team using the SCID. The medical assistants and the research team administering the SCID were blind to each patient's SRQ score. Fig. 1 is a diagram of the data-collecting procedure.

Sample size calculations and statistical analysis

The sample size was calculated based on showing a difference between study arms for the primary

https://doi.org/10.1017/S0033291713001141 Published online by Cambridge University Press

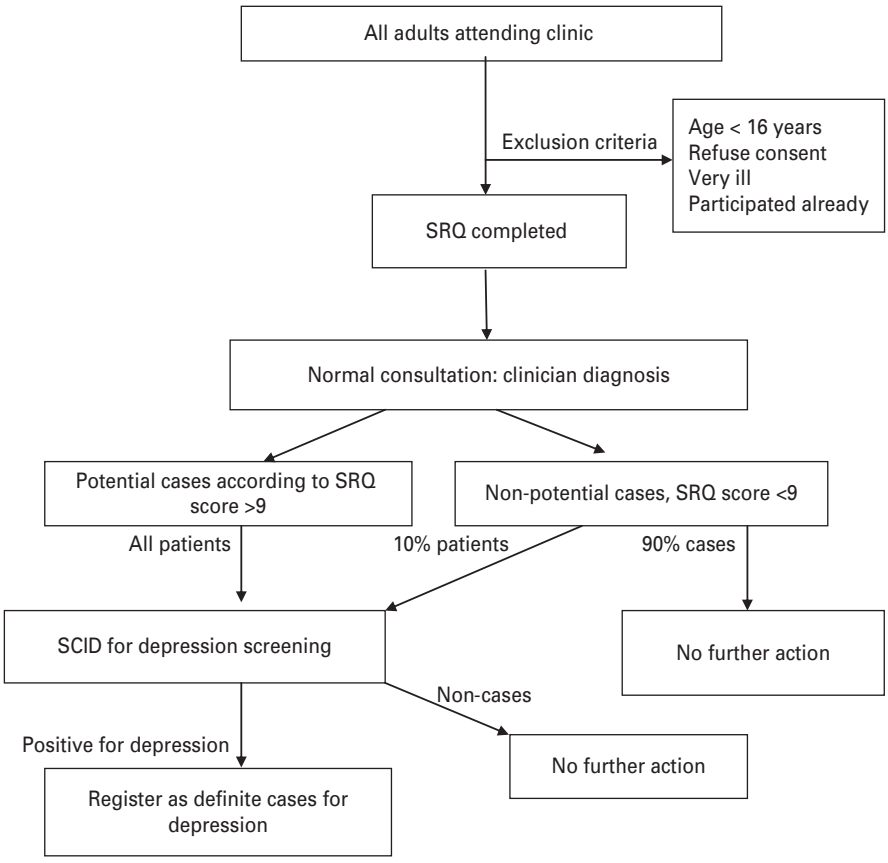

Fig. 1. Diagram of the study procedure at clinic level. SRQ, Self-Reporting Questionnaire; SCID-I/NP, Structured Clinical Interview for DSM-IV.

outcome, detection of depression. It was estimated that 2% of patients in the control arm will be treated for depression based on the results of a pilot study conducted 8 months before the main study, and an increase to 6% in the treatment arm would be a clinically relevant improvement. Using a 5% significance level and 80% power, an individual patient trial would require 373 subjects per arm. This number is inflated upwards to allow for the cluster-randomized study design. Assuming an intra-class correlation of 0.0125 and a fixed number of 18 clusters (nine per study arm), it was calculated that an average of 144 patients per cluster were required. This gave a total sample size of 1296 per arm, approximately 2600 in total.

Each health centre was allocated a number of patients for data collection depending on the average daily attendance rates. Once this number was reached for each health centre, the data collectors moved to the next health centre until data were collected for all 2600 patients.

To allow for the structure of the data, multilevel methods using STATA (StataCorp LP, USA) were used for the data analysis. Two-level models with individual patients nested within units were used rather than three levels of nesting because the proportion of units with more than one practitioner per cluster was much small compared with that with one practitioner per unit. Multilevel regression methods were used as opposed to traditional regression methods because traditional regression methods assume that all observations are independent of each other. This assumption is unlikely to be true for these data, as clusters of patients are obtained from the same units. It is likely that patients from the same unit will be more similar than patients from different units, thus violating the independence assumption. Failure to take account of the non-independence of the data can lead to incorrect estimates of the effect sizes, and also lead to the significance of the results being incorrect.

Diagnostic sensitivity for depression was calculated by dividing the number of true positive cases diagnosed by primary health workers by the total number of positives as identified by the research tool and multiplied by 100.

The accuracy of the diagnosis of anxiety made by primary health workers was based on whether the patients diagnosed had probable common mental disorder based on their SRQ score.

https://doi.org/10.1017/S0033291713001141 Published online by Cambridge University Press

Table 1. *Comparison of patient, practitioner and clinic factors between the two arms at baseline*

Variable	Category	Control arm	Intervention arm	OR (95% CI)	*p*
Gender, *n* (%)	Female	297 (69)	310 (76)	1	
	Male	133 (31)	97 (24)	0.68 (0.45 to 1.04)	0.08
Mean age, years (S.D.)[a]	–	35.6 (14.5)	35.3 (14.4)	0.0 (–2.6 to 2.6)	0.99
Age category, *n* (%)	⩽35 years	273 (64)	248 (61)	1	
	36+ years	156 (36)	159 (39)	1.19 (0.82 to 1.72)	0.36
Marital status, *n* (%)	Married	334 (78)	320 (79)	1	
	Single/divorced/widow	96 (22)	87 (21)	0.96 (0.69 to 1.35)	0.83
Occupation, *n* (%)	No job	78 (18)	91 (22)	1	
	Job	352 (82)	316 (78)	0.81 (0.41 to 1.63)	0.56
Symptoms, *n* (%)	Physical	430 (100)	407 (100)	–	–
Mean no. of symptoms (S.D.)[b]	–	1.8 (0.8)	2.0 (0.9)	1.11 (1.00 to 1.22)	0.04
Health worker gender, *n* (%)[c]	Female	3 (27)	3 (27)		1.00
	Male	8 (73)	8 (73)		
Health worker age, *n* (%)[c]	21–40 years	9 (82)	8 (73)		0.52
	40+ years	2 (18)	3 (27)		
Health worker previous training in mental health, *n* (%)[c]	No	2 (18)	2 (18)		1.00
	Yes	9 (82)	9 (82)		
Health worker duration of work, *n* (%)[c]	<5 years	9 (82)	8 (73)		1.00
	20+ years	2 (18)	3 (27)		
Number of clinic attendees, *n* (%)[d]	⩽100	7 (78)	7 (78)		1.00
	>100	2 (22)	2 (22)		

OR, Odds ratio; CI, confidence interval; S.D., standard deviation.
[a] Mean age difference (95% CI) reported.
[b] Incidence rate ratio (95% CI) reported.
[c] One observation per health worker used in the analysis.
[d] One observation per clinic used in the analysis.

Ethical approval

The study was approved by King's College London Ethics Committee and the National Health Sciences Ethics Committee in Malawi. All medical assistants who participated in the study were given an information sheet about the study and asked to give written consent if they agreed to participate in the study.

Patients were given verbal information read from an information sheet for patients and those who agreed to take part in the study gave a written consent. Those who could not write used their thumbprint to sign the consent form.

Results

Baseline study

At baseline, analysis of predictors was carried out at the three levels of patient, practitioner and clinic. Table 1 shows the results of the comparison of patient, practitioner and clinic factors.

There were no significant differences between the two arms as far as practitioner and clinic factors are concerned.

As can be seen from Table 1, there were no significant differences in all patient factors between the two arms apart from the number of symptoms presented by the patients. Patients in the intervention arm presented with more symptoms compared with patients in the control arm. The average number of presenting symptoms in the control arm was 1.8 while in the intervention arm the number was 2.0 (odds ratio 1.11, $p=0.04$). The highest number of symptoms presented by a single patient at baseline was five symptoms.

Diagnoses at baseline

Table 2 shows the results of the main outcomes at baseline. There were no significant differences in the rates of diagnoses of malaria between the two arms, with

https://doi.org/10.1017/S0033291713001141 Published online by Cambridge University Press

Table 2. *Results of main outcomes at baseline*

Variable	Category	Control arm, *n* (%)	Intervention arm, *n* (%)	OR (95% CI)	*p*
Malaria diagnosis	No	326 (76)	310 (76)	1	0.80
	Yes	104 (24)	97 (24)	0.95 (0.64–1.41)	
MSP diagnosis	No	379 (88)	319 (78)	1	0.10
	Yes	51 (12)	88 (22)	1.85 (0.89–3.85)	
Depression diagnosis	No	430 (100)	407 (100)	–	–
	Yes	0 (0)	0 (0)		
Anxiety diagnosis	No	430 (100)	407 (100)		
	Yes	0 (0)	0 (0)	–	–

OR, Odds ratio; CI, confidence interval; MSP, non-specific musculoskeletal pains.

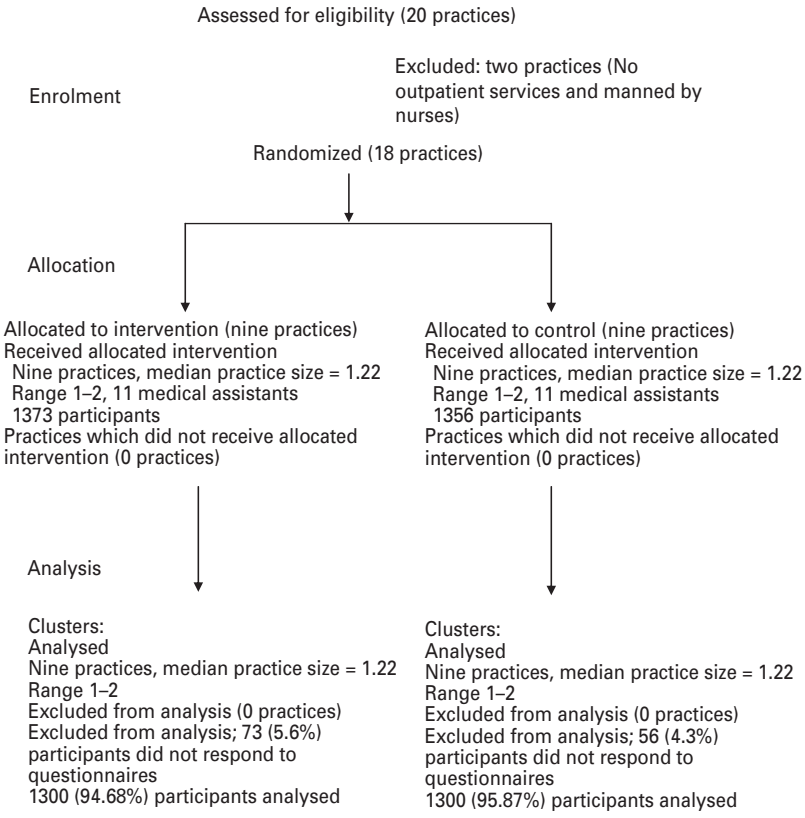

Fig. 2. Flow diagram of the post-intervention study.

24% of patients in both arms being diagnosed with malaria. Although there was a 10% difference in the rates of diagnosed cases of non-specific musculoskeletal pains at baseline between the two arms (control=12% and intervention=22%), the difference was not statistically significant (p=0.10). The rates for diagnosed cases of both depression and anxiety were found to be 0% at baseline in both arms.

Of the attendees who met the SCID criteria for diagnosis of depression at baseline, malaria and non-specific musculoskeletal pains were the two common diagnoses made by the PHC workers. Of the total number of patients who met the SCID criteria for diagnosis of depression at baseline, 31.0% were diagnosed with malaria by primary care practitioners while 14.3% were diagnosed with non-specific musculoskeletal pains.

Post-intervention study

Fig. 2 shows the flow diagram of the post-intervention study. Since practitioner and clinic factors remained

https://doi.org/10.1017/S0033291713001141 Published online by Cambridge University Press

Table 3. *Results of main outcomes in the post-intervention study*

Variable	Category	Control arm, *n* (%)	Intervention arm, *n* (%)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Malaria diagnosis	No	779 (60)	897 (69)	1	1
	Yes	521 (40)	403 (31)	0.56 (0.37–0.86)	0.62 (0.43–0.89)
p				0.007	0.01
MSP diagnosis	No	1202 (92)	1160 (89)	1	1
	Yes	98 (8)	140 (11)	1.24 (0.71–2.16)	0.62 (0.39–1.01)
p				0.46	0.06
Depression diagnosis[a]	No	1294 (100)	1181 (91)	1	–
	Yes	6 (1)	119 (9)	32.1 (7.4–144.3)	–
p				< 0.001	
Anxiety diagnosis[b]	No	1300 (100)	1284 (99)	–	–
	Yes	0 (0)	16 (1.2)	–	–
p				< 0.001	

OR, Odds ratio; CI, confidence interval; MSP, non-specific musculoskeletal pains.

[a] No baseline adjusted analysis was possible, as there were no diagnoses of depression at baseline.

[b] Analysis using Fisher's exact test, as there were no anxiety diagnoses in the control group. No baseline adjusted analysis was possible, as there were no diagnoses of anxiety at baseline.

Table 4. *Results of diagnostic parameters for depression*

	Control arm	Intervention arm
Diagnostic sensitivity, %	3.19	60.24
Diagnostic specificity, %	66.67	82.02
κ Coefficient	0.0145	0.4632

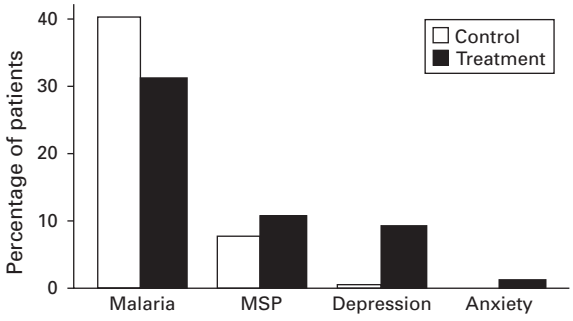

Fig. 3. Results at follow-up of main outcomes in the post-intervention study. MSP, Non-specific musculoskeletal pains.

the same as at baseline, no comparison was made for these factors for the post-intervention study.

The results of patient factors for the post-intervention study show that there were no significant differences between the two arms in all of the patient factors, unlike at baseline where there were significant differences in the number of presenting symptoms.

Diagnoses in the post-intervention study

Results of the main outcomes in the post-intervention study (see Table 3 and Fig. 3) show that there were significant differences in the rates of diagnosed cases of depression, anxiety and malaria between the two arms. There was a highly significant difference between control and intervention groups in the diagnosis of depression. The multilevel analysis indicated that the odds of a depression diagnosis in the intervention group were 32 times greater than the odds of depression diagnosis in the control arm. The occurrence of an anxiety diagnosis was also significantly higher in the intervention group than in the control group, i.e. 1.2% of patients were diagnosed with anxiety in the intervention group, compared with no patients in the control group. After adjusting for baseline differences, the odds of a malaria diagnosis were 1.7 times as great in the control group relative to the intervention group. The difference in non-specific musculoskeletal pains between the two arms in the post-intervention study had a *p* value of 0.06, just falling short of significance at the 5% level after adjusting for baseline differences.

Table 4 shows results of diagnostic sensitivity and specificity for depression in the two arms for the post-intervention study. Diagnostic sensitivity in the intervention arm was 60.24% while in the control arm it was 3.19%, with specificities of 82.02% and 66.67% in the intervention and control arms, respectively. The positive predictive value for diagnoses made in the

https://doi.org/10.1017/S0033291713001141 Published online by Cambridge University Press

intervention arm was 82.20%, while in the control arm it was 66.67%.

The calculated κ coefficient values were 0.0145 in the control arm and 0.4632 in the intervention arm; this means that PHC workers in the intervention arm were moderately good in making the diagnosis of depression in the post-intervention study.

Of the 16 patients diagnosed with anxiety disorders in the intervention group, seven (43.75%) had scores of more than 9 on the SRQ and the rest (56.25%) had scores of less than 9.

The intra-cluster correlation coefficients of the diagnoses made by the primary health workers of the four main outcomes were about 0.05, meaning that approximately 5% of the variation in the data was due to differences between units and the remaining variation was due to differences between patients.

Discussion

This cluster-randomized controlled trial evaluating mental health training in PHC, sufficiently powered and with a high response rate, showed that at baseline before training, there were no patients routinely diagnosed with depression by health workers in the primary care clinics. The trial also demonstrated that use of an interactive standardized structured training toolkit adapted for Malawi results in significant improvements in health workers' diagnostic ascertainment of depression, with a reduction in cases diagnosed with malaria.

The absence of health worker-diagnosed depression and anxiety at baseline is in contrast to the epidemiological prevalence rates of common mental disorders generally found in primary care (Dhadphale *et al.* 1983; Goldberg & Gater, 1996; Ngoma *et al.* 2003) or with the point prevalence rates for probable common mental disorder and depression found at baseline in attendees of primary care in this study, which were 28.8% and 19%, respectively, confirming that primary health workers in both arms were very poor at diagnosing common mental disorders at baseline.

Most of the patients who met the research tool diagnosis of depression at baseline were diagnosed by their health workers as having malaria and non-specific musculoskeletal pains. The lack of patients diagnosed by the health workers with common mental disorders at baseline is not consistent with epidemiological findings and misdiagnosis is the likely explanation.

A subsample of 73 patients (29 at baseline and 44 at follow-up) who met the research criteria for diagnosis of depression, and were diagnosed by their health worker as having malaria, had their temperatures measured and 87.8% of these patients were found to have no fever at all. Although we cannot conclusively rule out co-morbidity between depression and malaria, the absence of fever, which is a core feature of malaria, makes it more likely that most of them were erroneous diagnoses of malaria. We recognize that we cannot be conclusive in the absence of a 'gold standard' malaria microscopy test for malaria. However, data from the few health centres with malaria microscopy showed that of the 19 patients who were tested for malaria parasites at follow-up, 13 were negative while six were positive. Out of the 13 who were negative, 11 (85%) met the criteria for depression while only one of the six (17%) patients who had positive malaria parasites met the criteria for depression. All six who were positive for malaria parasites were diagnosed as having malaria while the 13 who were negative for malaria parasites had the following diagnoses made by the primary health workers: seven (54%) were diagnosed with depression; three (23%) were diagnosed with other physical illnesses which are not part of the four main outcome measures; two (15%) were diagnosed with non-specific musculoskeletal pains; and one (8%) was diagnosed with both depression and malaria.

The low rates of patients diagnosed with anxiety disorders could be as a result that the picture in community and primary care studies is often of a mixed anxiety-depressive disorder, and anxiety is often associated with mild depressive symptoms. Furthermore, studies in primary care (Vermani *et al.* 2011) have shown that most clinicians find it easier to make a diagnosis of depression compared with anxiety disorders; this possibly explains why 56.25% of patients diagnosed with anxiety disorders were false-positives based on their SRQ score.

The near-significant difference of $p=0.06$ in the rates of diagnosed cases of non-specific musculoskeletal pains between the two arms in the post-intervention study could be as a result of a much lower sample size of patients diagnosed with non-specific musculoskeletal pains. Alternatively, the diagnosis of common mental disorders by primary health workers had no significant impact on the number of patients diagnosed with non-specific musculoskeletal pains.

Besides differences in the overall content, the toolkit used in the intervention arm differed from the normal training delivered in the control arm in the format of the delivery of the training sessions. The format in the control arm was didactic and largely theoretical while that in the intervention arm used integrated short lectures, group discussions and role-plays. The toolkit also had sections on the link between physical illness and mental illness, including the relationship between malaria and depression. Primary health workers in the intervention arm were also given

https://doi.org/10.1017/S0033291713001141 Published online by Cambridge University Press

treatment algorithms based on the toolkit that were produced as part of the adaptation process for Malawi. This indicates that training programmes that have been adapted to the local context are likely to be more effective than generic ones.

In 1975, the WHO carried out a Collaborative Study on Strategies on Extending Mental Health in developing countries which involved training primary health workers in the four countries of Colombia, India, Sudan and Philippines (Cohen, 2001). Data were collected both at baseline and following training sessions on the ability of the primary care practitioners to recognize patients with psychiatric morbidity. The training packages used in that study differed from country to country due to the difference of cadres working in primary care. The training sessions were also based on what each country considered as priorities in their country. The duration of the training sessions also varied from a few hours to 60 h. In summary, results of the diagnostic parameters as found in the four countries were as follows. In Colombia, sensitivity was 18.8% pre-training and 61.3% post-training, while specificity was 92.3% pre-training and 82.5% post-training. In India, sensitivity was 35.4% pre-training and 23.2% post-training, while specificity was 95.5% pre-training and 94.4% post-training. In Sudan, sensitivity was 26.2% pre-training and 69.2% post-training, while specificity was 99.1% pre-training and 98.9% post-training. In the Philippines, sensitivity was 46.3% pre-training and 82.3% post-training, while specificity was 83.3% pre-training and 85.1% post-training.

The post-training sensitivity results in Colombia and Sudan are comparable with those found in the current study while those in the Philippines are higher than those found in the current study, with those from India being lower. Although comparison is being made with the results from the four countries, there were a number of differences between the studies in the four countries and the current study.

The first difference is that the studies in the four countries were not restricted to common mental disorders only in the evaluation and some countries like India included other diagnoses like psychosis and epilepsy, which are easier to diagnose than depression. The other major differences involve the design of the evaluations in the four countries. The evaluations were not randomized controlled trials and used a pre/post-design.

Another major problem with the evaluations in the four countries is the fact that the trainers had a dual function of training and evaluating the impact of the training sessions which could have led to bias in some cases.

Although there is need to carry out further research on the link between depression and malaria using laboratory tests and patient follow-up, our study shows that for adult patients who present with malaria-like symptoms with no accompanying fever and with negative parasites, common mental disorders are an important potential alternative diagnosis because of the presenting somatization of these disorders. Out of the 3437 patients who participated in the baseline and post-intervention data collection, only one patient presented with psychological symptoms during consultation. Screening for common mental disorders like depression in adult patients presenting with malaria-like symptoms but with no fever and negative parasites will go a long way in the detection of depression in primary care of developing countries. Another study conducted in Zimbabwe found that 40% of patients diagnosed with malaria had no fever (Prince *et al.* 2007).

Poor detection and management of people with mental health problems means that most remain untreated and disabled, leading to low productivity, high suicide rates, broken social relationships and contributing to the cycle of poverty in developing countries. In 2020, mental disorders are projected to increase to 15% of the global disease burden, and unipolar major depression could become the second leading factor in the disease burden (Ustün, 1999). Feasible and cost-effective psychological treatment programmes for common mental disorders (Bass *et al.* 2006; Rahman *et al.* 2008) that do not need specialists can improve outcomes in the large number of persons with common mental disorders and reduce the large burden of illness from these disorders in developing countries.

Conclusion

Training of PHC workers in mental health with an appropriate toolkit will contribute significantly to the quality of detection and management of patients seen in primary care in developing countries and reduce wastage of resources which results from misdiagnosis.

Acknowledgements

The Commonwealth Commission provided the funds for the Ph.D. studies of F.K. and the funds for carrying out the research project came from the Ministry of Health in Malawi. Neither sponsor had any role in the design, data analysis, data interpretation, writing of the report or in the decision to submit the report for publication. The corresponding author (F.K.) had full access to the data and final responsibility in the decision making including that of publication.

Declaration of Interest

None.

References

Bass J, Neugebauer R, Clougherty K, Verdeli H, Wickramaratne P, Ndogoni L, Speelman L, Weissman M, Bolton P (2006). Group interpersonal psychotherapy for depression in rural Uganda: 6-month outcomes. *British Journal of Psychiatry* **188**, 567–573.

Bowie C (2006). The burden of diseases in Malawi. *Malawi Medical Journal* **18**, 103–110.

Cohen A (2001). The effectiveness of mental health services in primary care: the view from the developing world. Geneva: World Health Organization (http://www.who.int/mental_health/media/en/50.pdf). Accessed February 2009.

Collins PY, Patel V, Joestl SS, March D, Insel TR, Daar AS; Scientific Advisory Board and the Executive Committee of the Grand Challenges on Global Mental Health, Anderson W, Dhansay MA, Phillips A, Shurin S, Walport M, Ewart W, Savill SJ, Bordin IA, Costello EJ, Durkin M, Fairburn C, Glass RI, Hall W, Huang Y, Hyman SE, Jamison K, Kaaya S, Kapur S, Kleinman A, Ogunniyi A, Otero-Ojeda A, Poo MM, Ravindranath V, Sahakian BJ, Saxena S, Singer PA, Stein DJ (2011). Grand challenges in global mental health. *Nature* **475**, 27–30.

Dhadphale A, Ellison AH, Griffin L (1983). Frequency of psychiatric disorders among patients attending semi-urban and rural general out-patient clinics in Kenya. *British Journal of Psychiatry* **142**, 379–388.

Goldberg D, Gater R (1996). Implications of the World Health Organization study of mental illness in general health care for training primary care staff. *British Journal of General Practice* **46**, 483–485.

Jenkins R, Kiima D, Njenga F, Okonji M, Kingora J, Kathuku D, Lock S (2010*a*). Integration of mental health into primary care in Kenya. *World Psychiatry* **9**, 118–120.

Jenkins R, Kiima D, Okonji M, Njenga F, Kingora J, Lock S (2010*b*). Integration of mental health into primary care and community health working in Kenya: context, rationale, coverage and sustainability. *Mental Health in Family Medicine* **7**, 37–47.

Ministry of Health and Population (2003). *Malawi Health Management Information Bulletin*, Special Issue 2002. Health Management Information Unit, Ministry of Health, Lilongwe, Malawi.

National Statistical Office of Malawi (2008). Population and Housing Census Preliminary Report, 2008 (http://www.nso.malawi.net/images/stories/data_on_line/demography/census_2008/Main%20Report/Census%20Main%20Report.pdf). Accessed May 2009.

Ndetei D (2008). Mental healthcare programs in Kenya: challenges and opportunities. *International Psychiatry* **5**, 31–32.

Ngoma MC, Prince M, Mann A (2003). Common mental disorders among those attending primary health clinics and traditional healers in urban Tanzania. *British Journal of Psychiatry* **183**, 349–355.

Prince M, Patel V, Saxena S, Maj M, Maselko J, Phillips M, Rahman A (2007). No health without mental health. *Lancet* **370**, 859–879.

Rahman A, Malik A, Sinkander S, Roberts C, Creed F (2008). Cognitive behavioural therapy-based intervention by community health workers for mothers with depression and their infants in rural Pakistan: a cluster controlled randomised trial. *Lancet* **372**, 902–909.

Stewart RC, Kauye F, Umar E, Vokhiwa M, Bunn J, Fitzgerald M, Tomenson B, Rahman A, Creed F (2009). Validation of a Chichewa version of the Self-Reporting Questionnaire (SRQ) as a brief screening measure for maternal depressive disorder in Malawi, Africa. *Journal of Affective Disorders* **112**, 126–134.

Stewart RC, Umar E, Kauye F, Bunn J, Vokhiwa M, Fitzgerald M, Tomenson B, Rahman A, Creed F (2008). Maternal common mental disorder and infant growth – a cross-sectional study from Malawi. *Maternal and Child Nutrition* **4**, 209–219.

Ustün TB (1999). The global burden of mental disorders. *American Journal of Public Health* **89**, 1315–1319.

Vermani M, Marcus M, Katzman M (2011). Rates of detection of mood and anxiety disorders in primary care: a descriptive, cross-sectional study. *Primary Care Companion for CNS Disorders* **13**. Published online 28 April 2011. doi:10.4088/PCC.10m01013.

WHO (2005). *Mental Health Atlas*. WHO: Geneva.

WHO UK Collaborating Centre (2003–2004). WHO Guide to Mental and Neurological Health in Primary Care: (http://www.mentalneurologicalprimarycare.org/downloads.asp). Accessed May 2009.