

RESEARCH ARTICLE

Open Access

Population level mental distress in rural Ethiopia

Abebaw Fekadu^{1,2*}, Girmay Medhin³, Medhin Selamu¹, Maji Hailemariam¹, Atalay Alem¹, Tedla W Giorgis⁴, Erica Breuer⁵, Crick Lund⁵, Martin Prince⁶ and Charlotte Hanlon^{1,6}

Abstract

Background: As part of a situational analysis for a research programme on the integration of mental health care into primary care (Programme for Improving Mental Health Care-PRIME), we conducted a baseline study aimed at determining the broad indicators of the population level of psychosocial distress in a predominantly rural community in Ethiopia.

Methods: The study was a population-based cross-sectional survey of 1497 adults selected through a multi-stage random sampling process. Population level psychosocial distress was evaluated by estimating the magnitude of common mental disorder symptoms (CMD; depressive, anxiety and somatic symptoms reaching the level of probable clinical significance), harmful use of alcohol, suicidality and psychosocial stressors experienced by the population.

Results: The one-month prevalence of CMD at the mild, moderate and severe threshold levels was 13.8%, 9.0% and 5.1% respectively. The respective one-month prevalence of any suicidal ideation, persistent suicidal ideation and suicide attempt was 13.5%, 3.8% and 1.8%. Hazardous use of alcohol was identified in 22.4%, significantly higher among men (33.4%) compared to women (11.3%). Stressful life events were widespread, with 41.4% reporting at least one threatening life event in the preceding six months. A similar proportion reported poor social support (40.8%). Stressful life events, increasing age, marital loss and hazardous use of alcohol were associated with CMD while stressful life events, marital loss and lower educational status, and CMD were associated with suicidality. CMD was the strongest factor associated with suicidality [e.g., OR (95% CI) for severe CMD = 60.91 (28.01, 132.48)] and the strength of association increased with increase in the severity of the CMD.

Conclusion: Indicators of psychosocial distress are prevalent in this rural community. Contrary to former assumptions in the literature, social support systems seem relatively weak and stressful life events common. Interventions geared towards modifying general risk factors and broader strategies to promote mental wellbeing are required.

Keywords: Common mental disorders, Psychosocial distress, Mental distress, Suicidality, Hazardous alcohol use, Wellbeing, Developing country, Africa South of the Sahara, Sub-Saharan Africa, Ethiopia

Background

Common mental disorders (CMD) refer to either the occurrence of a combination of non-specific anxiety, depressive and somatic symptoms [1] or anxiety, depressive and somatoform disorders “usually measured” with screening tools [2]. The exact genesis of the term is not clear but appears to have come into use with the decline in the use of the term “neurosis”. The leaders in the study of CMD have understood the shortcomings of the current international

classification systems [3]. They argue that most non-psychotic disorders have poorly defined boundaries and most individuals presenting to a primary care are likely to have a combination of anxiety, cognitive, depressive, somatic and vegetative complaints. Therefore, the term CMD has relevant heuristic value. But by using the term “common” to signify the common-ness of the CMDs, CMDs are often viewed as trivial and transient. Most descriptions of CMD are limited to the description of the mixed phenomenology and risk factors. Their treatment and course are not fully explored because the concept does not inform treatment to the satisfaction of clinicians. CMDs also do not fully match to the current international nosological systems of the International Classification of Diseases

* Correspondence: abe.wassie@kcl.ac.uk

¹Department of Psychiatry, School of Medicine, College of Health Sciences, Addis Ababa University, PO Box 9086, Addis Ababa, Ethiopia

²King's College London, Institute of Psychiatry, Department of Psychological Medicine, Centre for Affective Disorders, London, UK

Full list of author information is available at the end of the article

(ICD-10) [4] or the Diagnostic and Statistical Manual of Mental Disorders [5].

However, the CMD construct may be a very useful measure of the mental wellbeing of a population or a community, particularly if the assessment explores additional psychosocial risk factors that may indicate population level wellbeing and risk. CMDs can be measured easily and with minimal cost using a broad range of brief instruments that can be administered by lay interviewers with limited training. Because of the nature of categorical disorders defined by DSM and ICD systems, the level of mental disorder in a population is likely to be underestimated and, by measuring CMDs, the overall level of the psychosocial distress of a population could be evaluated more accurately resulting in an estimation closer to the actual population level morbidity. Additionally co-morbidity is less of an issue although substance related conditions are more discrete and need a separate measurement. Finally CMDs may predispose to more serious disorders although providing services may be more challenging. Therefore CMDs are likely to account for the majority of the burden of mental disorder in a population. This makes CMD of public health relevance and may be meaningful constructs to public health specialists and policy makers. CMDs should also inform treatment and attract service structuring and investment [3].

Additional population level indicators of mental distress and wellbeing may be suicidal behaviour and violence, and substance abuse. Suicidality is an important dimension of mental distress, which may be taken as an indication of the severity of a mental disorder. Suicidality may also be closely linked with impulse control, but probably mediated through various stressors and life events. Moreover, information on suicidal behaviour may not be volunteered by patients or families in low income countries because of the strong negative attitudes and shame associated with the behaviour in these settings [6-8]. Related to this negative attitude, service utilisation may be compromised. Thus, suicidal behaviour, CMD and other related psychosocial problems are important public health concerns that require further exploration. The main objective of this study was to explore the population level of burden of psychosocial problems in a rural community in Ethiopia. Specifically we aimed to determine the burden of CMD and suicidal behaviour and to assess for potential psychosocial and demographic factors associated with these outcomes.

The study was conducted as part of a situational appraisal for the Programme for Improving Mental Healthcare (PRIME) [9]. PRIME is a cross-country research consortium involving five low and middle income countries (Ethiopia, India, Nepal, South Africa and Uganda). The primary aim of PRIME is to develop evidence on the best methods of integrating mental health care into

primary care. PRIME in Ethiopia will introduce broad community based interventions and facility based interventions to support integration. The current baseline survey is an important first step to understand the baseline mental health context of the community in the study setting.

Methods

The study was a cross-sectional survey of adults aged 18 years and above. The study participants were selected randomly from all sub-districts of the Sodo district proportional to the size of the population of each sub-district.

Setting

The study was conducted in the Sodo district, Gurage Zone, Southern Nations, Nationalities and Peoples Region (SNNPR), a predominantly rural district located about 100 km south of the capital city, Addis Ababa. The population of the district is 161,952 persons (79,356 men; 82,596 women) living in 58 subdistricts (*kebeles*) [10]. The largest ethnic group in the district is Sodo Gurage (85.3%) followed by Oromo (11.6%) and Amhara (1.5%) and Amharic is the official language. The majority of the population are Orthodox Christian (97%) with Muslims making up 2.3%. Within Sodo district there are seven public health centres and one health centre run in a public-private partnership. There are 54 health posts (community based facilities), with another two under construction. The nearest hospital is located in Butajira town, 30 km South of Bui town, the capital of the district. At present there is no formal mental health care provided within the district. The nearest service is the nurse-led psychiatric unit in Butajira hospital. Sodo district was selected for this project because it is a relatively typical rural district for Ethiopia, and is located close to the research infra-structure of the Butajira research project on severe mental disorders and the Butajira Demographic Surveillance Site [11,12]. The site is also within reasonable travel distance of specialist mental health services.

Participants

Participants were consenting adults, aged 18 years and above, who had been residing in the district for at least six months. Participants were selected through systematic random sampling of households within each sub-district and by random sampling of one adult from each selected household. The number of participants selected from each sub-district was allocated proportionate to the number of households within each sub-district. A total of 1497 participants were included in the study. This sample size was based on the assumption that the prevalence of CMD would be about 10%, with a design effect of 1.5 (due to the multistage sampling of study

participants), a precision of 0.02 and a 15% non-response. The prevalence of 10% for calculating the sample size is based on a conservative approximation of the prevalence of CMD, which ranges from about 6% to about 40% (Table 1).

Assessment of CMD and psychosocial factors

The main outcomes of interest were CMD and suicidality. Suicidality was defined as a composite of persistent death wish, suicidal ideation and suicide attempt. Assessment instruments were administered by trained community health workers with a focus on evaluating

demographic status, CMD, suicidality, alcohol use disorder and psychosocial stressors. Socio-demographic assessment established basic demographic characteristics (age, sex, marital status, religion, ethnicity) and socioeconomic status (education, relative wealth and occupation). Relative wealth was assessed by simply asking the respondent what he/she perceived their wealth to be in relation to other people in the neighbourhood (poor, average or well-off).

Probable CMD was evaluated using the 10-item Kessler Psychological Distress scale (K10) [13], with three additional questions on suicidality. The K10 is a widely used

Table 1 Studies of CMD in Ethiopia over the past 40 years

Reference	Location	Setting	SS	CMD measure	CMD definition	Prevalence
First Generation studies						
[76]	Urban	Urban health centre	500	Psychiatrist	CPM	19.0%
	Urban	Community	100	Psychiatrist	CPM	8.6%
[77]	Rural	Community	100	Psychiatrist	CPM	9.0%
[78]	Urban	General hospital clinic	795	Psychiatrist	CPM	6.8%
	Urban	Police Hospital clinic	486	Psychiatrist	CPM	16.2%
[79]	Urban	District hospital clinic	465	Psychiatrist	CPM	18.3%
Second Generation Studies						
[80]	Urban	Community	40	SRQ-20	Cut-off ≥ 5	12.0%
[38]	Urban	Community (Mothers only)	611	SRQ-20	Cut-off ≥ 11	9.8%
[39]	Rural	Community	2000	SRQ-20	Cut-off ≥ 11	11.2%
[33]	Rural	Community	10468	SRQ-20	Cut-off ≥ 11	17.4%
[37]	Urban	Community	10203	SRQ-20	Cut-off ≥ 6	11.7%
[81]	Mixed	Community (Mothers only)	1400	SRQ-20	Cut-off ≥ 8	22.0%
[34,36]	Mixed	Community (Mothers only)	1652	SRQ-20	Cut-off ≥ 8	32.0%
[35]*	Rural	Community	902	HSCL		42.0% in women, 37.0% in men
[82]	Rural	Community (antenatal)	1065	SRQ-20	Cut-off ≥ 5	12.0%
[1]	Rural	Community (postnatal)	954	SRQ-20	Cut-off ≥ 5	4.6%
Third Generation Studies						
[41]	Rural	Community	501	CIDI 1-month	Dissociative disorders	4.5%
					Somatoform disorders	4.8%
					Anxiety disorders	2.9%
					Depressive disorder/dysthymia	4.9%
[46,47]	Urban	Community	1420	CIDI 1-month	Dissociative, somatoform or anxiety disorder	8.1%
			1420	CIDI 1-month	Depressive disorder/dysthymia	3.6%
[42,43]	Rural	Community (all women)	3016	CIDI 12-month	Depressive disorder	4.4%
					Anxiety disorder	5.7%
					Stress-related/somatoform	5.7%
		Community (married women)	1994	CIDI (12-month)	Depressive disorder	4.8%
[44]	Rural	Community	68378	CIDI (lifetime)	Minor depressive disorder	2.2%
[45]	Rural Island	Community	1714	CIDI (lifetime)	Minor depressive disorder	20.5%

Abbreviations: CIDI Composite International Diagnostic Interview, CMD Common Mental Disorder, CPM Conspicuous Psychiatric Morbidity, HSCL Hopkins Symptom Checklist, SRQ Self Reporting Questionnaire.

tool to assess non-specific psychological distress in the past month [13]. Each item is rated from 1–5, mainly based on the persistence of a specific symptom—none of the time, a little of the time, some of the time, most of the time, and all of the time. The total score for the 10-item scale is 50. The level of mental distress is then categorized into four groups: Those scoring 10–19 are likely to be well; those scoring 20–24 are likely to have mild mental disorder; those with a score of 25–29 are likely to have a moderate mental disorder; those scoring 30–50 are likely to have severe mental disorder [14]. A cut-off score of 19/20 has a sensitivity of 0.71 and a specificity of 0.90 in relation to meeting the criteria for anxiety and affective disorders according to the Composite International Diagnostic Interview [15]. Both the 10- and 6-item versions of the scale have been validated in Ethiopia among postnatal women, with the 10-item version showing superior validity [16]. We used the validated Amharic (the official language of Ethiopia) version of the K10 [16]. In this postnatal sample the sensitivity and specificity of the K10 were 0.78 and 0.84 respectively. The additional questions about suicide asked interviewees whether they had 1) experienced a death wish; 2) suicidal thoughts; and 3) attempted suicide in the previous 30 days. These three all together defined suicidal behavior.

Screening for alcohol use employed the Fast Alcohol Screening Test (FAST) derived from the Alcohol Use Disorder Identification Test (AUDIT) [17,18]. The FAST questionnaire has only four items and can be completed in just a minute. A total score of 3 or more confirms the occurrence of hazardous alcohol use [19], which was also what defined hazardous use in this study. The FAST has better psychometric properties than the CAGE [20,21], with sensitivity of 0.93 and specificity of 0.88 [19], and comparable to the AUDIT [22]. It is also reported to have a higher sensitivity and specificity than the AUDIT when used in emergency departments [23]. Although not validated in the Ethiopian setting, the AUDIT has been used in neighbouring East African countries [24,25]. Local alcoholic beverages were converted into standard equivalent alcohol units [26].

Experience of stressful life events during the six months period prior to assessment and social support were assessed using the List of Threatening Experiences (LTE) [27] and the Oslo 3-item Social Support Scale (OSS) [28] respectively. The LTE contains 12 categories of significant life events, for example relating to death of close persons, loss of relationships, imprisonment, and being the victim of theft. These 12 categories accounted for two thirds of all events collected in the original development of the tool. The LTE has good test-retest reliability (Kappa: 0.61-0.87) and predictive validity [29]. The OSS contains three items assessing the number of close confidants, perceived level of concern from others

and perceived ease of getting help from neighbours. Based on the raw scores, the scale allows a summary score (range 3–14) or categories of social support (strong, average and poor) to be generated. The OSS has good convergent and predictive validity [30,31].

Administration of assessment instruments

Assessment instruments were administered by trained community health workers in Amharic, the local language of the district. These health workers were high school graduates with one year of training in health care. They were trained for two days and the instruments were piloted and pre-tested in selected sub-districts. The data collection was supervised by nurses and data supervisors with many years of experience in administering a range of mental health-related instruments.

Data management and analyses

Data were entered into Epi-data version 3.1 and analysed using the Statistical Packages for Social Sciences, version 20 (SPSS 20; IBM Corp 2012). Simple descriptive analyses were used to summarise the profile of the outcomes and factors. Logistic regression models were fitted to assess the association of the two main outcomes (CMD and suicidal behaviour evaluated one at a time) with potential risk factors. These potential risk factors were selected a priori based on evidence from existing literature and our theoretical assumption that these factors would be relevant for the outcomes of interest. Analyses of associations for CMD focused on moderate and severe disorder. Association for suicidal behaviour focused on persistent death wish, frequent suicidal ideation (occurring for at least 50% of time) and suicide attempt. Only factors that were associated with the particular outcome (CMD or suicidality) in the univariate models were included in the corresponding multivariable models in order to limit the potential risk of over-adjusting without compromising identification of potential predictors for each outcome. Most of the variables were analysed as set in the original data collection tools, except for the main psychosocial factors (life events and social support). Thus experience of life events were grouped into three categories (none; 1–2 life events and 3 and above). The total social support scores were re-categorised as per the recommended classes of poor, moderate and strong social support. Additionally, the individual social support domains were entered into the model separately. A main category of formal and informal education (those without formal schooling) were included to take into account the large number of people in Ethiopia who are literate (are able to read and write) through various educational routes, such as religious programmes and the governmental literacy programmes.

Ethical considerations

The study was approved by the Scientific Committee of the Department of Psychiatry, Addis Ababa University, and the Institutional Review Board of the College of Health Sciences of Addis Ababa University. The conduct of the study was consistent with the Declaration of Helsinki (<http://www.wma.net/en/30publications/10policies/b3/>). In all cases, informed consent was sought after adequate information about the study, and the potential benefits and risks, had been provided. Participants who had significant level of depression or were suicidal were assessed by a psychiatric nurse and psychiatry residents. Whenever required, treatment was offered to these free of charge.

Table 2 Socio-demographic characteristics of participants (n = 1497)

Characteristics	Number (%)
Sex (n = 1497)	Male 743 (49.6)
	Female 754 (50.4)
Age categories (years) (n = 1483)	<25 226 (15.2)
	25-34 422 (28.5)
	35-44 392 (26.4)
	45-59 321 (21.6)
	60 & above 122 (8.2)
Age (years) (n = 1483)	Mean (SD) 37.7 (13.5)
Marital status (n = 1484)	Married 1110 (74.8)
	Single 255 (17.2)
	Formerly married* 75 (5.1)
Ethnicity (n = 1490)	Gurage 1409 (94.6)
	Others** 81 (5.4)
Religion (n = 1441)	Orthodox Christian 1327 (92.1)
	Protestant 80 (5.6)
	Muslim 33 (2.3)
Education (n = 1375)	Non-literate 592 (43.1)
	Literate but no formal education 328 (23.9)
	Formal education 455 (33.1)
Occupation (n = 1436)	Housewife 404 (28.1)
	Farmer 770 (53.6)
	Private business 130 (9.1)
	Other*** 132 (9.1)
Residence (n = 1486)	Urban 139 (9.4)
	Rural 1347 (90.7)
Perceived relative wealth (n = 1458)	Poor 498 (34.2)
	Average 793 (54.4)
	High 167 (11.5)

*Divorced/widowed/separated; **Amhara, Oromo, Tigre; ***Civil servant and students.

Results

Demographic characteristics

A total of 1497 people were interviewed. Most participants were from the Gurage ethnic group (94.6%), resided in rural villages (90.7%) and were of Orthodox Christian religion. About half (50.4%) were women. The median age of participants was 35.0 years (interquartile range, 27.8 - 45.0) with 8.2% aged 60 or above. Over half of the participants were either illiterate (43.1%) or had not received any formal education although were able to read and write (23.9%). Details are provided in Table 2.

Psychosocial factors, common mental disorders and suicidal behaviour

Major stressful life events experienced in the previous six months were common and reported by 44.7% of the interviewees. Of these 28.6% had experienced one or two life events while 16.1% had experienced three or more life events. Only 11.9% reported strong social support, while 41.8% reported poor social support (Table 3). Nearly half reported they were either uncertain about the concern that others show towards them or that concern from others was non-existent (49.4%) while 55.9% reported that they find it difficult to get help from others. The overall prevalence of probable CMD was 27.9% (95% CI = 25.6, 30.2), mostly mild (13.9%) or moderate (8.9%) in severity; 5.0% had severe CMD (Table 2). The prevalence (95% CI) of death wish, suicidal ideation, persistent suicidal ideation and actual suicide attempts, constituting suicidal behaviour in the last one-month,

Table 3 Distribution of adverse life experiences, social support and psychological distress

Characteristics	Number (%)
Number of stressful life events* (N = 1449)	None 801 (55.3)
	1 or 2 415 (28.6)
	3 and above 233 (16.1)
Social support (N = 1412)	Poor 590 (41.8)
	Moderate 654 (46.3)
	Strong 168 (11.9)
Common mental disorder (N = 1475)	Likely well 1064 (72.1)
	Mild disorder 205 (13.9)
	Moderate disorder 132 (8.9)
	Severe disorder 74 (5.0)
Hazardous use of alcohol (N = 1382)	None 1070 (77.4)
	Yes 312 (22.6)
Suicidality (in previous 30 days)	Wish to die (N = 1491) 306 (20.5)
	Suicidal ideation (N = 1497) 202 (13.5)
	Persistent death wish (N = 1444) 47 (3.3)
	Suicide attempt (N = 1493) 21 (1.4)

*Also called threatening life experiences by the developers of the instrument.

Table 4 Univariate analysis of factors associated with common mental disorder

		Well or only mild disorder n%		Moderate or severe disorder n%		Odds ratio	95% CI	p value
		N%		N%				
Sex								
	Male	631	49.7	105	51.0	1.0		
	Female	638	50.3	101	49.0	0.96	0.76 1.20	0.689
Residence								
	Urban	115	9.1	22	10.7	1.0		
	Rural	1144	90.9	184	89.3	1.19	0.74 1.93	0.481
Marital status								
	Single	222	17.6	31	15.3	1.0		
	Married	952	75.5	141	69.5	1.04	0.69 1.57	0.855
	Formerly married	85	6.8	31	15.3	2.46	1.44 4.26	0.001
Ethnicity								
	Gurage	1199	95.0	190	92.2	1.0		
	Other	63	5.0	16	7.8	0.62	0.35 1.10	0.105
Religious affiliation								
	Orthodox	1125	92.1	184	92.9	1.0		
	Other	97	7.9	14	7.1	0.85	0.48 1.52	0.578
Occupation								
	House wife	346	28.5	54	26.9	1.0		
	Farmer	646	53.2	114	56.7	0.91	0.52 1.60	0.749
	Private	112	9.2	14	7.0	1.03	0.61 1.74	0.910
	Other	111	9.1	19	9.5	0.73	0.35 1.53	0.404
Age								
	Median (IQR)	35.0 (27.8, 45.0)		38.0 (29.1, 50.0)			1.01 1.03	0.002
Relative wealth								
	Better off	149	12.0	17	8.6	1.0		
	Average	689	55.6	93	47.0	1.19	0.69 2.05	0.539
	Poor	401	32.4	88	44.4	1.97	1.14 3.42	0.016
Education								
	Formal education	391	33.7	58	30.2	1.0		
	Literate but no formal education	270	23.3	53	27.6	1.32	0.88 1.98	0.174
	Non-literate	500	43.1	81	42.2	1.09	0.76 1.57	0.633
Mental illness in family								
	None	978	80.7	138	70.8	1.0		
	Yes	234	19.3	57	29.2	1.73	1.23 2.43	0.002
Life events								
	None	746	60.8	48	23.6	1.0		
	≤2 events	332	27.1	74	36.5	3.65	2.53 5.27	<0.001
	>2 events	148	12.1	81	39.9	8.25	5.57 12.22	<0.001
Social support								
	Strong	152	12.6	15	7.9	1.0		
	Average	555	46.2	88	46.3	1.65	0.93 2.94	0.088
	Poor	495	41.2	87	45.8	1.79	1.00 3.18	0.048

Table 4 Univariate analysis of factors associated with common mental disorder (Continued)

Can count on others									
	At least on 1 person to count on	1164	86.9	175	86.2	1.0			
	None	90	7.2	28	13.8	2.07	1.32	3.26	0.002
Concern from others									
	At least some concern	616	50.6	80	41.7	1.0			
	Little or uncertain	601	49.4	112	58.3	1.44	1.05	1.95	0.022
Ease of help									
	Easy	556	44.1	77	37.7	1.0			
	Difficult	704	55.9	127	62.3	1.30	0.96	1.77	0.088
Harmful use of alcohol									
	None	989	80.2	137	67.8	1.0			
	Yes	244	19.8	65	32.2	1.92	1.39	2.67	<0.001

were found in 20.5% (18.5, 22.7), 13.5% (11.8, 15.3), 3.3% (2.4, 4.3) and 1.4% (0.9, 2.1) respectively. About a fifth (22.4%) reported hazardous use of alcohol, higher among men (33.4%) compared to women (11.3%). This difference was statistically significant: $X^2(1) = 62.1$; $p < 0.001$.

Factors associated with common mental disorder and suicidal behaviour

Both univariate (Tables 4 and 5) and multivariable (Tables 6 and 7) models are presented. In the multivariable model, factors associated with CMD were increasing age (OR = 1.01; 95% CI = 1.00, 1.03; $p = 0.035$), loss of marriage (OR = 2.34; 95% CI = 1.20, 4.58; $p = 0.013$), experience of threatening life events in the previous six months (OR = 1.49; 95% CI = 1.01, 2.20; $p = 0.046$), and hazardous use of alcohol (OR = 1.92; 95% CI = 1.39, 2.67; $p < 0.001$). Experiencing one or two life events increased the odds of CMD about four fold (OR = 3.74; 95% CI = 2.42, 5.78; $p < 0.001$) while experiencing three or more life events doubled the odds to over eight fold (OR = 8.90; 95% CI = 5.57, 14.21; $p < 0.001$).

Marital status, lower educational status, experience of stressful life events and CMD were all associated independently with suicidal behaviour. Thus being married (OR = 1.95; 95% CI = 1.01, 3.77; $p = 0.046$), being non-literate (OR = 2.29; 95% CI = 1.33, 3.93; $p = 0.003$) or not having formal education (OR = 2.06; 95% CI = 1.15, 3.70; $p = 0.016$), approximately doubled the odds of exhibiting suicidal behaviour. Both life events and CMD showed an increase in odds of suicidal behaviour with increase in frequency of life events as well as increase in the severity of the CMD, as shown in Table 7.

Discussion

Indicators of high level of population level distress were found in this rural district manifested in terms of relatively high levels of CMD, suicidal behaviour, and

threatening life events occurring in the context of low levels of reported social support. In relation to CMD, the prevalence found in our study is overall comparable to what has been reported in Ethiopia albeit on the higher margins. For ease of comparison, studies of CMD that have been conducted in Ethiopia are summarised in Table 1. These studies may be categorised into three generations based on the method of case detection and case definition. Case detection in the first generation studies was based on interview by psychiatrists and the studies were conducted in healthcare facilities and in small communities. The facility-based studies reported the prevalence of “conspicuous psychiatric morbidity” to be 16% to 18%. The prevalence from the community-based studies was relatively low, around 6%. The second generation studies used screening tools administered by lay interviewers, mainly the Self Reporting Questionnaire (SRQ) [32]. The SRQ was developed specifically for use in low and middle income countries and does not have a recommended cut-off for defining “caseness”. In these studies of CMD that used the SRQ in Ethiopia, the cut-off values for caseness varied from 5/6 to 11/12. The prevalence of CMD varied from between 5% to about 30% [1,33-39]. Generally studies with lower prevalence of CMD used lower cut-offs. Although the use of such varied cut-offs makes interpretation more difficult, the use of screening tools enables larger populations to be studied. Thus two of the second generation studies evaluated over 10,000 people [33,37]. The third generation studies have used diagnostic assessments, mainly the lay interviewer-administered Composite International Diagnostic Interview [40]. These studies were able to describe the prevalence of various individual conditions that overlap with the concept of CMD (mainly anxiety disorders, depression, somatoform disorders). The prevalence of these disorders varied between 2% and 20% [41-47]. The use of a diagnostic instrument was perhaps a major step forward.

Table 5 Univariate model of factors associated with suicidality

		Non-suicidal		Suicidal		Odds ratio	95% CI		p value
		n	%	n	%				
Sex									
	Male	627	50.3	111	46.3	1.0			
	Female	620	49.7	129	53.8	1.18	0.89	1.55	0.253
Residence									
	Urban	118	9.5	20	8.4	1.0			
	Rural	1119	90.5	219	91.6	0.87	0.53	1.42	0.569
Marital status									
	Single	231	18.7	22	9.2	1.0			
	Married	916	74.2	186	77.8	2.13	1.34	3.39	0.001
	Formerly married	88	7.1	31	13.0	3.70	2.03	6.73	<0.001
Ethnicity									
	Gurage	1176	94.8	225	93.8	1.0			
	Other	64	5.2	15	6.3	0.82	0.46	1.46	0.493
Religious affiliation									
	Orthodox	1109	92.0	211	93.4	1.0			
	Other	97	8.0	15	6.6	0.81	0.46	1.43	0.471
Occupation									
	House wife	338	28.4	65	27.7	1.0			
	Farmer	635	53.3	129	54.9	0.95	0.56	1.62	0.858
	Private	110	9.2	19	8.1	1.01	0.61	1.65	0.980
	Other	109	9.1	22	9.4	0.86	0.44	1.67	0.648
Age									
	Median (IQR)	35.0(27.0, 45.0)		38.0 (30.0, 50.0)		1.02	1.01	1.03	<0.001
Relative wealth									
	Better off	147	12.1	80	7.6	0.49	0.28	0.83	0.008
	Average	620	55.2	119	50.2	0.70	0.52	0.94	0.019
	Poor	396	32.6	199	42.2	1.0			
Education									
	Formal education	404	35.4	48	21.2	1.0			
	Able to read/write	261	22.9	65	28.8	2.10	1.40	3.14	<0.001
	Not literate	475	41.7	113	50.0	2.00	1.39	2.88	<0.001
Mental illness in family									
	None	959	80.3	167	74.6	1.0			
	Yes	236	19.7	57	25.4	1.39	0.99	1.93	0.054
Life events									
	None	736	61.0	62	26.6	1.0			
	≤2 events	320	26.5	91	39.1	3.38	2.38	4.78	<0.001
	>2 events	151	12.5	80	34.3	6.29	4.32	9.15	<0.001
Social support									
	Strong	141	12.0	26	11.5	1.0			
	Average	552	46.9	98	43.2	0.84	0.62	1.13	0.245
	Poor	485	41.2	103	45.4	0.87	0.54	1.39	0.555

Table 5 Univariate model of factors associated with suicidality (Continued)

Can count on others									
	At least on 1 person to count on	1138	92.4	211	88.7	1.0			
	None	94	7.6	27	11.3	1.55	0.99	2.44	0.058
Concern from others									
	At least some concern	606	50.8	98	43.0	1.0			
	Little or uncertain	587	49.2	130	57.0	1.37	1.03	1.82	0.031
Ease of help									
	Easy	546	44.1	90	38.0	1.0			
	Difficult	693	55.9	147	56.9	1.29	0.97	1.71	0.083
Hazardous alcohol use									
	None	959	79.3	180	76.3	1.0			
	Yes	251	20.7	56	23.7	1.19	0.85	1.65	0.305

Although our study looked at the prevalence of CMD, the primary objective of our study was to make a determination of the population level mental distress for the provision of a community level intervention. In this context, our study is the only one in Ethiopia that brings together broad population level distress indicators (suicidality and alcohol use disorder) [48] including CMD and psychosocial stressors. Within the context of CMD studies over the past 40 years, our study is also meaningful given the changes in the country in the past 15 years and the need to understand the impact of these changes on mental health. It is notable, however, that the prevalence of CMD is generally comparable to the older studies from over 15 years ago.

In the context of what is known about CMD in Ethiopia, our study indicates that CMD are relevant public health concerns. At present, the national plan for the scale up of mental health care understandably focuses on more severe disorders (psychosis, major depressive disorder and epilepsy) [49]. Our study indicates that CMD and associated suicidal behaviour are common and need to be considered in the provision of care although the approach may need to include interventions at the population level to address population level determinants.

Suicidal behaviour and psychosocial factors related to mental disorders and suicidal behaviour have not been explored in any detail in Ethiopia. Two studies looked at the lifetime prevalence of suicide attempt, which varied between 1% and 3% [50,51]. For the most part the exploration of psychosocial factors was limited to socio-demographic factors. In line with previous findings, this PRIME study found lower level of education, life events and mental disorder were associated with suicidality [52-54]. The association of married status with suicidality was not in agreement with other studies, for example that of the World Mental Health Survey [54]. We did not explore the reasons for this association. However,

one potential explanation is conflicts within marriage or love relations, which are reported to be common psychosocial factors identified in people attempting suicide in Africa [50,51,55,56]. Further replication of this finding and exploration of potential factors that may increase the risk of suicidal behaviour in the African context is required.

The main factors associated with CMD were psychosocial stressors (stressful life events), which was in the expected direction. Loss of a marriage was associated with CMD as reported elsewhere in Africa [57,58] as was increasing age [57,59]. Although low social support was associated with CMD only in the univariate model, it was associated with suicidal behaviour in the full model. Low social support is likely to be an important factor in the pathway to CMD as well as suicidality. It is of note that the finding of low social support goes against the general assumption that social support may be better in “developing” countries because of the extended family and community networks [60-62]. Of interest is that the association of relative wealth with both CMD and suicidality observed in the univariate analysis falls away in multivariable analysis, a pattern observed in relation to income in other LMICs [2]. The combination of higher level of negative life events, lower education, and low social support in conjunction with higher level of stigma [63,64], is likely to constitute a toxic milieu for the onset and maintenance of mental distress and suicidal behaviour.

The very high level of association between CMD and suicidality supports the proposal that “the reductionist model”, which views suicidal behaviour in low income countries as an impulsive response to the stresses of life, is not accurate [65,66]. Mental disorder is likely to be an important concomitant of suicidality and should be considered in all individuals presenting with such behaviour. Furthermore, given the high association between suicidal

Table 6 Multivariable model of factors associated with common mental disorder

	Odds ratio	95% CI		p value
Demographic Factors				
Age	1.01	1.00	1.03	0.035
Marital status				
Single	1.0			
Married	0.99	0.59	1.64	0.954
Formerly married	2.34	1.20	4.58	0.013
Economic Factors				
Relative wealth				
Better off	1.0			
Average	0.76	0.41	1.41	0.391
Poor	1.23	0.66	2.29	0.524
Psychosocial factors				
Life events				
None	1.0			
≤2 life events	3.74	2.42	5.78	<0.001
>2 life events	8.90	5.57	14.21	<0.001
Social support				
Strong	1.0			
Average	0.77	0.40	1.48	0.432
Poor	0.96	0.66	1.39	0.834
Can count on others				
At least 1 person to count on	1.0			
None	0.97	0.55	1.71	0.920
Concern from others				
At least some concern	1.0			
Little or uncertain	1.36	0.95	1.94	0.092
Clinical factors				
Family history of illness				
No	1.0			
Yes	1.09	0.69	1.72	0.920
Harmful use of alcohol				
None	1.0			
Yes	1.49	1.01	2.20	0.046

behaviour and CMD, primary care staff training should include training on the assessment of psychosocial needs and the provision of care for all who present to primary care with suicidal behaviour.

Our study indicates the widespread occurrence of psychosocial stressors. Thus addressing CMD and suicidal

Table 7 Multivariable model of factors associated with suicidality

	Odds ratio	95% CI		p value
Demographic Factors				
Age	1.01	1.00	1.03	0.142
Marital status				
Single	1.0			
Married	1.95	1.01	3.77	0.046
Formerly married	1.42	0.60	3.39	0.430
Education				
Formal education	1.0			
Able to read/write	2.06	1.15	3.70	0.016
Non-literate	2.29	1.33	3.93	0.003
Psychosocial factors				
Life events				
None	1.0			
≤2 life events	2.41	1.53	3.80	<0.001
>2 life events	2.84	1.67	4.82	<0.001
Clinical factors				
Family history of illness				
No	1.0			
Yes	1.48	0.91	2.40	0.111
Severity of CMD				
None	1.0			
Mild	6.38	3.97	10.24	<0.001
Moderate	14.54	8.56	24.70	<0.001
Severe	60.91	28.01	132.48	<0.001

CMD = common mental disorder.

behaviour is likely to require broader programmes of psychosocial intervention. Despite the concerns about the acceptability of “talking treatments” in developing countries [67], psychosocial interventions have to be developed as part of the larger scale up plan in the country and in the context of district level programmes of intervention such as PRIME. Given the effectiveness of psychosocial interventions [68-73], improving the acceptability of talking treatments through cultural adaptation of content and delivery of interventions would be important.

Limitations

The study is cross-sectional and we cannot make inferences about causality. Although the main outcome instrument used in this study has been validated in the country, it was not validated in the local setting. However, pretesting of the instrument was carried out in this local setting. The instruments on CMD focus more on frequency of symptoms than clinical relevance (for example level of distress or disability). Although interpretation of

the CMD syndrome identified here may appear difficult, evidence suggests that even mild disorders are associated with impairment [74,75]. Therefore, even if the degree of impairment was not specifically assessed, many people identified with CMD are likely to have a degree of impairment [74]. It is also to be noted that most cases of CMD have milder condition; and although the prevalence appears high, not all individuals with CMD would require treatment. Therefore, identifying individuals that are more likely to require and benefit from treatment is necessary. The analyses did not take into account fully the multi-stage nature of the sampling because we did not have a reliable estimate of the size of eligible household members. However, the sampling at the sub-district level was self-weighting given the sampling at the sub-district level was proportional to the number of households in the sub-districts.

Conclusions

The population level mental distress as indicated by the level of symptoms of CMD, suicidal behaviour, hazardous use of alcohol and the prevalent nature of risk factors for mental distress in the population is high [52,53]. The results of the study argue for the provision of population level interventions to reduce risk factors and to promote wellbeing. The results also suggest that simple psychosocial interventions applicable for this context need to be developed. Although variation in the prevalence of CMD is observed depending on methods and settings [76-82], overall, there is some consistency in the prevalence of CMD over the years.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

AF, GM, CL and CH developed the study plan. MS and MH supported data collection. AF, GM and CH participated in the data analysis. AF wrote the initial draft. All authors read the manuscripts, provided intellectual input and approved the final draft and submission.

Acknowledgement

This material has been funded by UK Aid from the UK Government, however the views expressed do not necessarily reflect the UK Government's official policies.

We gratefully acknowledge the support we received from the Sodo district health office, the district administration, the health extension workers who collected the data and the supervisors.

Author details

¹Department of Psychiatry, School of Medicine, College of Health Sciences, Addis Ababa University, PO Box 9086, Addis Ababa, Ethiopia. ²King's College London, Institute of Psychiatry, Department of Psychological Medicine, Centre for Affective Disorders, London, UK. ³Addis Ababa University, Akilu Lemma Institute of Pathobiology, Addis Ababa, Ethiopia. ⁴Federal Ministry of Health, Addis Ababa, Ethiopia. ⁵Alan J Flisher Centre for Public Mental Health, Department of Psychiatry and Mental Health, University of Cape Town, Cape Town, South Africa. ⁶King's College London, Institute of Psychiatry, Health Services and Population Research Department, London, UK.

Received: 18 January 2014 Accepted: 24 June 2014

Published: 7 July 2014

References

1. Hanlon C, Medhin G, Alem A, Araya M, Abdulahi A, Tomlinson M, Hughes M, Patel V, Dewey M, Prince M: **Sociocultural practices in Ethiopia: association with onset and persistence of postnatal common mental disorders.** *Br J Psychiatry* 2010, **197**(6):468–475.
2. Lund C, Breen A, Flisher AJ, Kakuma R, Corrigall J, Joska JA, Swartz L, Patel V: **Poverty and common mental disorders in low and middle income countries: A systematic review.** *Soc Sci Med* 2010, **71**:517–528.
3. Goldberg D, Goodyer I: *The origins and course of common mental disorder.* Sussex: Routledge; 2005.
4. World Health Organization: *The International Classification of Diseases.* 10th edition. Geneva: World Health Organization; 1992.
5. American Psychiatric Association: *The Diagnostic and Statistical Manual of Mental Disorders.* 4th edition. Washington, DC: American Psychiatric Association; 1994.
6. Alem A, Jacobsson L, Kebede D, Kullgren G: **Awareness and attitude of a rural Ethiopian community toward suicidal behaviour: a community informant study in Butajira, Ethiopia.** *Acta Psychiatr Scand* 1999, **100**:65–69.
7. Mugisha J, Hjelmeland H, Kinyanda E, Knizek BL: **Distancing: a traditional mechanism of dealing with suicide among the Baganda, Uganda.** *Transcult Psychiatry* 2011, **48**(5):624–642.
8. Osafo J, Hjelmeland H, Akotia CS, Knizek BL: **Social injury: An interpretative phenomenological analysis of the attitudes towards suicide of lay persons in Ghana.** *Int J Qual Stud Health Well-being* 2011, **6**(4): doi:10.3402/qhw.v3406i3404.8708.
9. Lund C, Tomlinson M, De Silva M, Fekadu A, Shidhaye R, Jordans M, Petersen I, Bhana A, Kigozi F, Prince M, Thornicroft G, Hanlon C, Kakuma R, McDaid D, Saxena S, Chisholm D, Raja S, Kippen-Wood S, Honikman S, Fairall L, Patel V: **PRIME: A programme to reduce the treatment gap for mental disorders in five low and middle-income countries.** *PLoS Med* 2012, **9**(12):e1001359. doi:10.1371/journal.pmed.1001359.
10. Hanlon C, Luitel NP, Kathree T, Murhar V, Shrivasta S, Medhin G, Ssebunnya J, Fekadu A, Shidhaye R, Jordans M, Kigozi F, Thornicroft G, Patel V, Tomlinson M, Lund C, Breuer E, De Silva M, Prince M: **Challenges and opportunities for implementing integrated mental health care: a situation analysis from five low- and middle-income country districts.** *PLOS One* 2014, In Press.
11. Byass P, Berhane Y, Emmelin A, Kebede D, Andersson T, Högborg U, Wall S: **The role of demographic surveillance systems (DSS) in assessing the health of communities: An example from rural Ethiopia.** *Public Health* 2002, **116**(3):145–150.
12. Shamebo D, Muhe L, Sandström A, Wall S: **The Butajira Rural Health Project in Ethiopia: Mortality Pattern of the Under Fives.** *J Trop Pediatr* 1991, **37**(5):254–261.
13. Kessler RC, Andrews G, LJ C, Hiripi E, Mroczek DK: **Short screening scales to monitor population prevalences and trends in non-specific psychological distress.** *Psychol Med* 2002, **32**:959–976.
14. Victorian Government Department of Human Services the Health Surveillance and Evaluation Section: *Victorian Population Health Survey 2001: selected findings.* Victoria: Rural and Regional Health and Aged Care Services Division; 2001.
15. Andrews G, Slade T: **Interpreting scores on the Kessler Psychological Distress Scale (K10).** *Aust N Z J Public Health* 2001, **25**(6):494–497.
16. Tesfaye M, Hanlon C, Alem A: **Detecting Postnatal Common Mental Disorders in Addis Ababa Ethiopia: Validation of the Edinburgh Postnatal Depression Scale and Kessler Scales.** *J Affect Disord* 2010, **122**:102–108.
17. Babor TF, Higgins-Biddle JC, Saunders JB, Monteiro MG: *The Alcohol Use Disorders Identification Test: Guidelines for Use in Primary Health Care.* 2nd edition. Geneva: World Health Organization; 2001.
18. Hodgson R, Alwyn T, John B, Thom B, Smith A: **The FAST Alcohol Screening Test.** *Alcohol Alcohol* 2002, **37**:61–66.
19. Hodgson RJ, John B, Abbasi T, Hodgson RC, Waller S, Thom B, Newcombe RG: **Fast screening for alcohol misuse.** *Addict behav* 2003, **28**(8):1453–1463.
20. Chan AW, Pristach EA, Welte JW: **Detection by the CAGE of alcoholism or heavy drinking in primary care outpatients and the general population.** *J Subst Abuse* 1994, **6**(2):123–135.
21. Kelly TM, Donovan JE, Chung T, Bukstein OG, Cornelius JR: **Brief screens for detecting alcohol use disorder among 18-20 year old young adults in**

- emergency departments: Comparing AUDIT-C, CRAFFT, RAPS4-QF, FAST, RUFT-Cut, and DSM-IV 2-Item Scale. *Addict Behav* 2009, **34**(8):668–674.
22. Meneses-Gaya C, Crippa JA, Zuardi AW, Loureiro SR, Hallak JE, Trzesniak C, de Sousa JP M, Chagas MH, Souza RM, Martin-Santos R: **The fast alcohol screening test (FAST) is as good as the AUDIT to screen alcohol use disorders.** *Subst Use Misuse* 2010, **45**(10):1542–1557.
 23. Health Development Agency: *Manual for the Fast Alcohol Screening Test*. London: Health Development Agency; 2002.
 24. Saunders JB, Aasland OG, Babor TF, de la Fuente JR, Grant M: **Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO Collaborative Project on Early Detection of Persons with Harmful Alcohol Consumption—II.** *Addiction* 1993, **88**:791–804.
 25. Chishinga N, Kinyanda E, Weiss HA, Patel P, Ayles H, Seedat S: **Validation of brief screening tools for depressive and alcohol use disorders among TB and HIV patients in primary care in Zambia.** *BMC Psychiatry* 2011, **11**:75.
 26. Fekadu A, Alem A, Hanlon C: **Alcohol and drug abuse in Ethiopia: past, present and future.** *Afr J Drug Alcohol Studies* 2007, **6**:39–53.
 27. Brugha T, Bebbington P, Tennant C, Hurry J: **The List of Threatening Experiences: a subset of 12 life event categories with considerable long-term contextual threat.** *Psychol Med* 1985, **15**:189–194.
 28. Dalgard OS, Dowrick C, Lehtinen V, Vazquez-Barquero JL, Casey P, Wilkinson G, Ayuso-Mateos JL, Page H, Dunn G: **Negative life events, social support and gender difference in depression: a multinational community survey with data from the ODIN study.** *Soc Psychiatry Psychiatr Epidemiol* 2006, **41**(6):444–451.
 29. Motrico E, Moreno-Küstner B, de Dios LJ, Torres-González F, King M, Nazareth I, Montón-Franco C, Josefa G, Gómez-Barragán M, Sánchez-Celaya M, Ángel Díaz-Barreiros M, Vicens C, Moreno-Peral P, Bellón JÁ: **Psychometric properties of the List of Threatening Experiences—LTE and its association with psychosocial factors and mental disorders according to different scoring methods.** *J Affect Disord* 2013, **150**(3):931–940.
 30. Boen H, Dalgard OS, Bjertness E: **The importance of social support in the associations between psychological distress and somatic health problems and socio-economic factors among older adults living at home: a cross sectional study.** *BMC Geriatr* 2012, **12**:27.
 31. Fekadu A, Rane LJ, Wooderson SC, Markopoulou K, Poon L, Cleare AJ: **Prediction of longer-term outcome of treatment-resistant depression in tertiary care.** *Br J Psychiatry* 2012, **201**:369–375.
 32. World Health Organization: *A user's guide to the Self Reporting Questionnaire (SRQ)*. Geneva: Mental Health Division, World Health Organization; 1994.
 33. Alem A, Kebede D, Woldeesemiat G, Jacobsson L, Kullgren G: **The prevalence and socio-demographic correlates of mental distress in Butajira, Ethiopia.** *Acta Psychiatr Scand Suppl* 1999, **99**(397):48–55.
 34. De Silva MJ, Huttley SR, Harpham T, Kenward MG: **Social capital and mental health: A comparative analysis of four low income countries.** *Soc Sci Med* 2007, **64**:5–20.
 35. Hadley C, Tegegn A, Tessema F, Cowan JA, Asefa M, Galea S: **Food insecurity, stressful life events and symptoms of anxiety and depression in east Africa: evidence from the Gilgel Gibe growth and development study.** *Epidemiol Community Health* 2008, **62**:980–986.
 36. Harpham T, Huttly S, De Silva MJ, Abramsky T: **Maternal mental health and child nutritional status in four developing countries.** *J Epidemiol Community Health* 2005, **59**:1060–1064.
 37. Kebede D, Alem A, Rashid E: **The prevalence and socio-demographic correlates of mental distress in Addis Ababa, Ethiopia.** *Acta Psychiatr Scand Suppl* 1999, **99**(397):5–10.
 38. Mulatu MS: **Prevalence and risk factors of psychopathology in Ethiopian children.** *J Am Acad Child Adolesc Psychiatry* 1995, **34**(1):100–109.
 39. Tafari S, Aboud FE, Larson CP: **Determinants of mental illness in a rural Ethiopian adult population.** *Soc Sci Med* 1991, **32**(2):197–201.
 40. World Health Organization: *Composite International Diagnostic Interview, version 2.1*. Geneva: World Health Organization; 1997.
 41. Awas M, Kebede D, Alem A: **Major mental disorders in Butajira, southern Ethiopia.** *Acta Psychiatr Scand Suppl* 1999, **99**(397):56–64.
 42. Deyessa N, Berhane Y, Alem A, Ellsberg M, Emmelin M, Hogberg U, Kullgren G: **Intimate partner violence and depression among women in rural Ethiopia: a cross-sectional study.** *Clin Pract Epidemiol Ment Health* 2009, **5**(8): doi:10.1186/1745-0179-1185-1188.
 43. Deyessa N, Berhane Y, Alem A, Hogberg U, Kullgren G: **Depression among women in rural Ethiopia as related to socioeconomic factors: A community-based study on women in reproductive age groups.** *Scand J Public Health* 2008, **36**:589–597.
 44. Fekadu A, Alem A, Medhin G, Shibire T, Cleare T, Prince M, Kebede D: **Utility of the concept of minor depressive disorder: Evidence from a large rural community sample in a developing country setting.** *J Affect Disord* 2007, **104**:111–118.
 45. Fekadu A, O'Donovan MC, Alem A, Kebede D, Church S, Johns L, Medhin G, Prince M, Shibire T: **Validity of the concept of minor depression in a developing country setting.** *J Nerv Ment Dis* 2008, **196**:22–28.
 46. Kebede D, Alem A: **Major mental disorders in Addis Ababa, Ethiopia. III. Neurotic and somatoform disorders.** *Acta Psychiatr Scand Suppl* 1999, **397**:24–29.
 47. Kebede D, Alem A: **Major mental disorders in Addis Ababa, Ethiopia. II. Affective disorders.** *Acta Psychiatr Scand Suppl* 1999, **397**:18–23.
 48. Kraus RF, Buffier PA: **Sociocultural Stress and the American Native in Alaska: An analysis of changing patterns of psychiatric illness and alcohol abuse among Alaska Natives.** *Cult Med Psychiatry* 1979, **3**:111–151.
 49. Federal Democratic Republic of Ethiopia Ministry Of Health: *National Mental Health Strategy 2012/13 - 2015/16*. Addis Ababa: Federal Ministry of Health; 2012.
 50. Alem A, Kebede D, Jacobsson L, Kullgren G: **Suicide attempts among adults in Butajira, Ethiopia.** *Acta Psychiatr Scand Suppl* 1999, **397**:70–76.
 51. Kebede D, Alem A: **Suicide attempts and ideation among adults in Addis Ababa, Ethiopia.** *Acta Psychiatr Scand Suppl* 1999, **397**:35–39.
 52. de Menil V, Osei A, Douptcheva N, Hill AG, Yaro P, De-Graft Aikins A: **Symptoms of common mental disorders and their correlates among women in Accra, Ghana: a population-based survey.** *Ghana Med J* 2012, **46**(2):95–103.
 53. Patel V, Kleinman A: **Poverty and common mental disorders in developing countries.** *Bull World Health Organ* 2003, **81**(8):609–615.
 54. Borges G, Nock MK, Haro Abad JM, Hwang I, Sampson NA, Alonso J, Andrade LH, Angermeyer MC, Beautrais A, Bromet E, Bruffaerts R, de Girolamo G, Florescu S, Gureje O, Hu C, Karam EG, Kovess-Masfety V, Lee S, Levinson D, Medina-Mora ME, Ormel J, Posada-Villa J, Sagar R, Tomov T, Uda H, Williams DR, Kessler RC: **Twelve-month prevalence of and risk factors for suicide attempts in the World Health Organization World Mental Health Surveys.** *J Clin Psychiatry* 2010, **71**(12):1617–1628.
 55. Kinyanda E, Hjelmeland H, Musisi S: **Deliberate self-harm as seen in Kampala, Uganda - a case-control study.** *Soc Psychiatry Psychiatr Epidemiol* 2004, **39**(4):318–325.
 56. Ndosi NK, Waziri MC: **The nature of parasuicide in Dar es Salaam Tanzania.** *Soc Sci Med* 1997, **44**(1):55–61.
 57. Abiodun OA: **A study of mental morbidity among primary care patients in Nigeria.** *Compr Psychiatry* 1993, **34**(1):10–13.
 58. Kadri N, Agoub M, Assouab F, Tazi MA, Didouh A, Stewart R, Paes M, Toufiq J, Moussaoui D: **Moroccan national study on prevalence of mental disorders: a community-based epidemiological study.** *Acta Psychiatr Scand* 2010, **121**:71–74.
 59. Jenkins R, Njenga F, Okonji M, Kigamwa P, Baraza M, Ayuyo J, Singleton N, McManus S, Kiima D: **Prevalence of common mental disorders in a rural district of Kenya, and socio-demographic risk factors.** *Int J Environ Res Public Health* 2012, **9**(5):1810–1819.
 60. Isaac M, Chand P, Murthy P: **Community Schizophrenia outcome measures in the wider international.** *Br J Psychiatry* 2007, **191**:s71–s77.
 61. Kurihara T, Kato M, Reverger R, Tirta IGR: **Eleven-year clinical outcome of schizophrenia in Bali.** *Acta Psychiatr Scand* 2005, **112**:456–462.
 62. Jablensky A, Sartorius N, Ernberg G, Anker M, Korten A, Cooper JE, Day R, Bertelsen A: **Schizophrenia: manifestations, incidence and course in different cultures: A World Health Organization Ten-Country Study.** *Psychol Monogr Suppl* 1992, **20**:1–97.
 63. Assefa A, Shibire T, Asher L, Fekadu A: **Internalized stigma among patients with schizophrenia in Ethiopia: a cross-sectional facility-based study.** *BMC Psychiatry* 2012, **12**:239.
 64. Shibire T, Negash A, Kullgren G, Kebede D, Alem A, Fekadu A, Fekadu D, Medhin G, Jacobsson L: **Perception of stigma among family members of individuals with schizophrenia and major affective disorders in rural Ethiopia.** *Soc Psychiatry Psychiatr Epidemiol* 2001, **36**:299–303.
 65. Khan MM, Mahmud S, Karim MS, Zaman M, Prince M: **Case-control study of suicide in Karachi, Pakistan.** *Br J Psychiatry* 2008, **193**:402–405.
 66. Qadir F, de Silva P, Prince M, Khan M: **Marital satisfaction in Pakistan: a pilot investigation.** *Sexual Rel Ther* 2005, **20**:195–209.
 67. Patel V: **The need for treatment evidence for common mental disorders in developing countries.** *Psychol Med* 2000, **30**(4):743–746.

68. Patel V, Araya R, Chatterjee S, Chisholm 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.** *Lancet* 2007, **370**:991–1005.
69. Kitchener BA, Jorm AF: **Mental health first aid training for the public: evaluation of effects on knowledge, attitudes and helping behavior.** *BMC Psychiatry* 2002, **2**(10): doi:10.1186/1471-1244X-1182-1110.
70. Patel V, Simon G, Chowdhary N, Kaaya S, Araya R: **Packages of Care for Depression in Low- and Middle-Income Countries.** *PLoS Med* 2009, **6**(10):e1000159.
71. Patel V, Thornicroft G: **Packages of Care for Mental, Neurological, and Substance Use Disorders in Low- and Middle-Income Countries: PLoS Medicine Series.** *PLoS Med* 2009, **6**(10):e1000160.
72. Patel V, Weiss HA, Chowdhary N, Naik S, Pednekar S, Chatterjee S, Bhat B, Araya R, King M, Simon G, Verdelli H, Kirkwood B: **Lay health worker led intervention for depressive and anxiety disorders in India: impact on clinical and disability outcomes over 12 months.** *Br J Psychiatry* 2011, **199**:459–466.
73. Patel V, Weiss HA, Chowdhary N, Naik S, Pednekar S, Chatterjee S, De Silva MJ, Bhat B, Araya R, King M, Simon G, Verdelli H, Kirkwood BR: **Effectiveness of an intervention led by lay health counsellors for depressive and anxiety disorders in primary care in Goa, India (MANAS): a cluster randomised controlled trial.** *Lancet* 2010, **376**(9758):2086–2095.
74. Kessler RC, Berglund P, Demler O, Jin R, Merikangas KR, Walters EE: **Lifetime prevalence and age-of-onset distributions of DSM-IV Disorders in the National Comorbidity Survey Replication.** *Arch Gen Psychiatry* 2005, **62**:593–602.
75. Rapaport MH, Judd LL: **Minor depressive disorder and subsyndromal depressive symptoms: functional impairment and response to treatment.** *J Affect Disord* 1998, **48**(2–3):227–232.
76. Giel R, Van Luijk JN: **Psychiatric morbidity in a small Ethiopian town.** *British Journal of Psychiatry* 1969, **115**(519):149–162.
77. Giel R, van Lijck JN: **Psychiatric morbidity in a rural village in south-western Ethiopia.** *Int J Soc Psychiatry* 1970, **16**(1):63–71.
78. Doormar M: **Psychiatric illness in two contrasting Ethiopian outpatient populations.** *Soc Psychiatry* 1974, **9**:155–161.
79. Jacobsson L: **Psychiatric morbidity and psychosocial background in an outpatient population of a general hospital in western Ethiopia.** *Acta Psychiatr Scand* 1985, **71**(4):417–426.
80. Kortmann F, ten Horn S: **Comprehension and motivation in responses to a psychiatric screening instrument. Validity of the SRQ in Ethiopia.** *Br J Psychiatry* 1988, **153**:95–101.
81. Tadesse B, Kebede D, Tegegne T, Alem A: **Childhood behavioural disorders in Ambo district, western Ethiopia. I. Prevalence estimates.** *Acta Psychiatr Scand Suppl* 1999, **397**:92–97.
82. Hanlon C, Medhin G, Alem A, Tesfaye F, Lakew Z, Worku B, Dewey M, Araya M, Abdulahi A, Hughes M, Tomlinson M, Patel V, Prince M: **Impact of antenatal common mental disorders upon perinatal outcomes in Ethiopia: the P-MaMiE population-based cohort study.** *Trop Med Int Health* 2009, **14**(2):156–166.

doi:10.1186/1471-244X-14-194

Cite this article as: Fekadu et al.: Population level mental distress in rural Ethiopia. *BMC Psychiatry* 2014 **14**:194.

Submit your next manuscript to BioMed Central and take full advantage of:

- Convenient online submission
- Thorough peer review
- No space constraints or color figure charges
- Immediate publication on acceptance
- Inclusion in PubMed, CAS, Scopus and Google Scholar
- Research which is freely available for redistribution

Submit your manuscript at
www.biomedcentral.com/submit

