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Journal of Affective Disorders 87 (2005) 193–201

JOURNAL OF  
**AFFECTIVE  
DISORDERS**

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Research report

## Prevalence and clinical characteristics of bipolar I disorder in Butajira, Ethiopia: A community-based study

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Received 1 December 2004; received in revised form 18 March 2005; accepted 18 March 2005

Available online 23 May 2005

### Abstract

**Background:** Bipolar disorders have been extensively studied in the high-income countries but community-based studies from low-income countries are very rare. The main objectives of the current study are to estimate the lifetime prevalence of bipolar I disorder in the general population of the Butajira district in Ethiopia and to characterize the onset and course of the disorder in a predominantly treatment naïve population.

**Method:** Cases were identified by a door-to-door screening of the district's entire adult population aged 15 to 49 years ( $N=83,387$ ), where 68,378 were successfully screened. CIDI and key informant method were used in the first stage of screening followed by confirmatory SCAN interviews.

**Results:** Three hundred fifteen cases were identified and complete information could be collected for 295 individuals. Of these, 55.3% were males, 83.1% were from a rural area, and 70.2% were illiterate. Lifetime prevalence of bipolar I disorder was estimated to be 0.6% for males and 0.3% for females. The mean age of cases was 29.5 years, with no significant sex difference. The mean age of first recognition of illness was 22.0 years; for men 22.3 years and for women 21.2 years. The mean age at onset of manic phase of the illness was found to be 22.0 years (22.5 for men and 21.4 for women). The mean age at onset of depressive phase was 23.4 years (24.1 for men and 22.5 for women). There was no significant sex difference in the age of onset of manic or depressive phases. In 22.7% of the cases bipolar I illness started with a depressive episode and in 77.3% of the cases it started with a manic episode. Two or more episodes of the illness were reported by 64.1%. Over half of the study subjects (55.9%) had never sought any help from modern healthcare sector, and only 13.2% had ever been admitted to psychiatric hospital. During the survey 7.1% of the cases were undergoing treatment. A previous suicide attempt was reported by 8.1% of the males and 5.4% of the females.

**Conclusion:** The overall lifetime prevalence and age of onset are within the range of findings from other studies in Western countries. In contrast to most previous studies, prevalence of the disorder among females was half of that among males. Our

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finding that prevalence of this disorder among males and females appeared to be different from many other studies warrants further research.

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*Keywords:* Bipolar I disorder; Rural Ethiopia; Onset and course; Epidemiology

## 1. Introduction

Valid and representative epidemiological data on magnitude, patterns, predictors, and outcome of specific psychiatric disorders derived from community-based surveys have important scientific and health policy implications. Studying community samples is especially important as the majority of people with severe mental disorders do not seek treatment, particularly in low-income countries. Accumulated evidence suggests that mental disorders could be the most burdensome of all human diseases. They are common, have much earlier ages of onset than most chronic physical diseases, have high rates of chronicity exposing the affected individuals to high risks of impairment and disablement, and rates of treatment are often low (Kessler et al., 1997).

There is a paucity of scientific data regarding the prevalence, course, and outcome of mental disorders in low income countries. Few resources are allocated to the health sector in general and only a tiny portion of these is allocated to mental health services. This is very much the case in Ethiopia where health services are poorly developed, extremely understaffed, suffer from budgetary deficiencies, and mental health services are the least developed (Alem, 2000). Previous studies conducted in Ethiopia have consistently shown that mental disorders are common problems in the country (Alem et al., 1995; Kebede and Alem, 1999; Awas et al., 1999; Jacobsson, 1985).

Bipolar I disorder is one of the major and disabling mental illnesses. The lifetime prevalence is reported from various countries ranges from 0.3% to 3% (Robins et al., 1991; Weissman et al., 1996; Kessler et al., 1997; ten Have et al., 2002; Witchen et al., 1992; Kupfer et al., 2002; Hilty et al., 1999; Szadoczky et al., 1998). It represents a major public health problem and leads to high mortality from suicide, accidental death, and somatic complications (Tsuang et al., 1980; Weeke and Vaeth, 1986; Sharma and Markar, 1994). To our

knowledge, no previous population-based study on bipolar I disorder has been conducted in a rural area of a low income country, and there is very limited knowledge regarding onset and course from countries where psychiatric services are very poor.

This paper reports on the lifetime prevalence of bipolar I disorder in a predominantly rural district of Ethiopia and the onset and course of the disorder based on retrospective data obtained from the subjects at the time of recruitment.

## 2. Method

### 2.1. The setting

The study was conducted in Meskan and Mareko District, in south central Ethiopia. The district is named after two predominant ethnic groups residing in it. Butajira is the capital town of the district and the whole district is thus often referred to as Butajira. The town is located about 135 km south of Addis Ababa. According to the 1994 census, the district has a total population of 227 135 (OPHCC, 1994). It is bounded by the Great Rift Valley in the east and its altitude ranges from 1500 to 3400 m above sea level. The population is predominantly Moslem and the vast majority live in rural areas. Health facilities are very much limited to towns and mostly to sub districts accessible by transport (health posts). There was no psychiatric service in the district prior to the establishment of a psychiatric outpatient unit in Butajira town by the present research project.

### 2.2. Instruments

First stage screening was using Composite International Diagnostic Interview CIDI (WHO, 1997) with additional key informants identification of prob-

able cases followed by confirmatory interviews according to Schedules for Clinical Assessment in Neuropsychiatry SCAN (Wing et al., 1990; Andrews and Peters, 1998). Studies on reliability, and acceptability of these and other instruments were done in Ethiopia earlier (Rashid et al., 1996). Cases underwent further assessment for baseline information using Basic Information on Study Subjects (BISS), and the Life Chart Score Sheet, LCSS (Sartorius and Janka, 1996). Trained Psychiatric nurses completed the BISS. LCSS and other baseline information were collected by psychiatric residents.

### 2.3. Subjects and design

The study was a cross-sectional door-to-door survey conducted under the framework of the course and outcome of schizophrenia and bipolar disorders study project that screened the entire adult population of the Butajira district aged 15 to 49 years in order to gather a cohort with lifetime problems of schizophrenia, bipolar disorders, and major depression. Description of the study setting and the design of the overall project as well as findings regarding onset and course of schizophrenia have been reported elsewhere (Kebede et al., 2003a,b; Shibre et al., 2002).

It has been estimated that there are close to 100 000 inhabitants aged 15 to 49 years in the region. One district with an estimated population aged 15–49 years of 17 000 individuals could not be reached due to geographical conditions. Out of those approached ( $n=83\ 387$ ), we were able to reach 68 378 individuals (82.2%) for CIDI interviews (29 050 males and 39 328 females); 2161 (3.2%) were identified as probable cases of schizophrenia, bipolar disorder, or major depression. Key informants identified 719 individuals whom they believed suffered from severe mental illness. Overall 2880 individuals were invited for confirmatory assessment by clinicians using SCAN. Out of all 2880 individuals invited for SCAN interview, 2152 (74.7%) were interviewed.

### 2.4. Data management

A full-time data editor checked all questionnaires for completeness, consistency, and accuracy in the

field. Baseline data were then entered into computers using EPI-6.02 program. CIDI and SCAN data entry programs were used to enter data obtained by these two instruments. A double data entry scheme was employed to ensure consistency and accuracy of data entry. The retrospective information obtained at baseline was used to describe clinical course of the illness. Analyses were carried out using the Statistical Package for Social Sciences (SPSS 10,0).

Table 1  
Sociodemographic characteristics of cases of bipolar I disorder

	<i>n</i>	%
<i>Sex (n= 295)</i>		
Male	163	55.3
Female	132	44.7
<i>Age in years (n= 295)</i>		
15–19	29	9.8
20–29	122	41.4
30–39	93	31.5
40–49	51	17.3
<i>Residence (n= 295)</i>		
Urban	50	16.9
Rural	245	83.1
<i>Educational level (n= 295)</i>		
Not literate	207	70.2
Elementary	64	21.7
Secondary	24	8.1
<i>Employment (n= 277)</i>		
Unemployed	21	7.6
Full-time paid work	32	11.7
Farmers	126	45.3
Domestic work	98	35.4
<i>Marital status (n= 295)</i>		
Never married	78	26.4
Married	187	63.4
Other	30	10.2
<i>Previous psychiatric treatment (N= 295)</i>		
Never	274	92.9
Yes	21	7.1
<i>Family history of mental illness (N= 282)</i>		
No	225	79.8
Yes	57	20.2

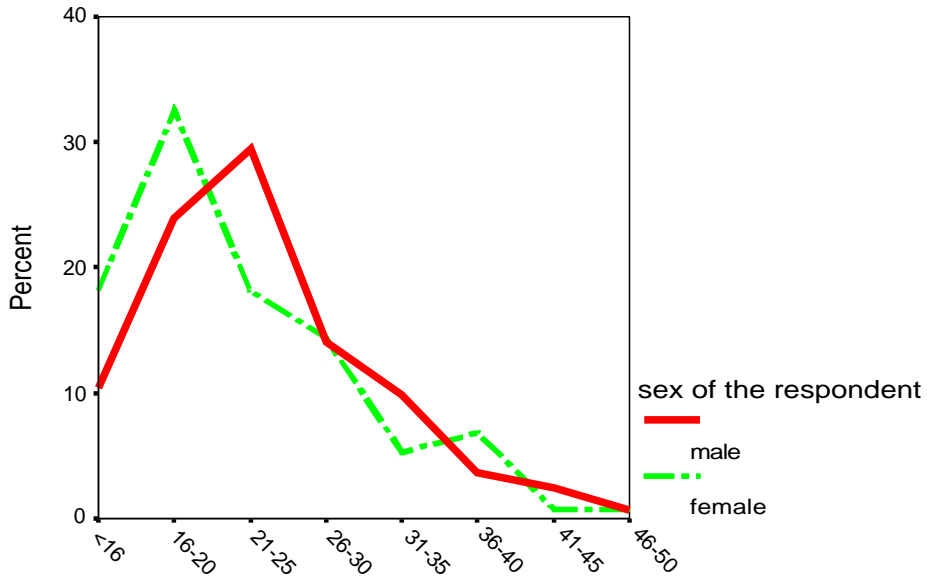


Fig. 1. Age of first onset of manic phase of bipolar I disorder by sex.

2.5. Ethical clearance

The study was approved by the review committees of the Department of Community Health and the Faculty of Medicine of Addis Ababa University.

3. Results

The sociodemographic characteristics of the cases are summarized in Table 1. Based on the baseline population of 68 378 the lifetime prevalence of

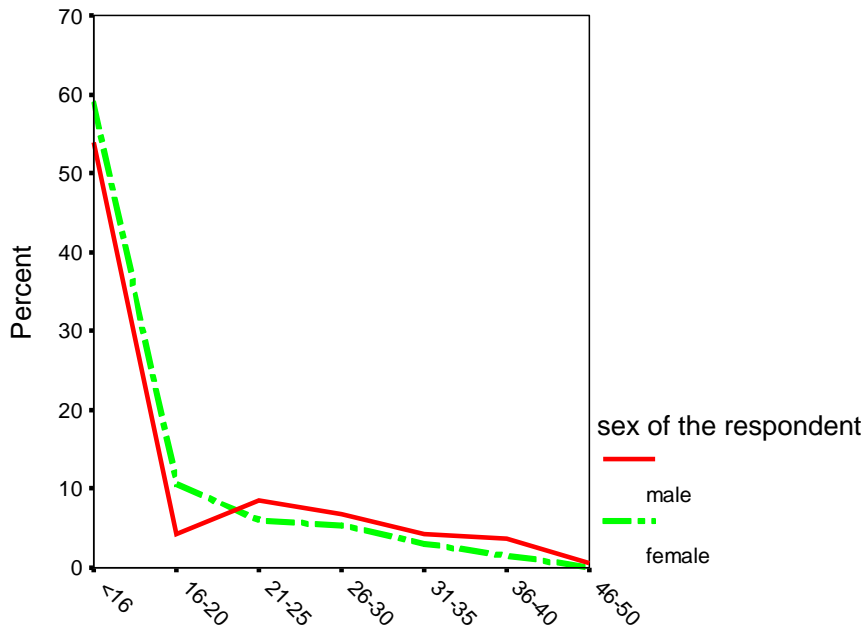


Fig. 2. Age of first onset of depressive phase of bipolar I disorder by sex.

bipolar I disorder was estimated to be 0.5% ( $n=315$ ), 0.6% for men and 0.3 for women. Complete information relevant for this report was obtained from 295 individuals.

The male to female ratio was 1.2:1, and the mean age at enrollment to the study was 29.5 years with no gender difference (males=29.5 years, S.D.=8.3; females=29.6 years, S.D.=8.4;  $t=1.77$ ,  $P=0.8$ ). About half of the cohort was under 30 years of age, the majority was from a rural setting, less than one fifth had had some form of primary education and less than 1 in 10 had completed one or more grades at secondary school. Around two-thirds were married, more than one-fourth had never been married, and about 1 in 10 belonged to the divorced, separated, or widowed group ('others').

Figs. 1 and 2 and Table 2 summarize the age at onset of bipolar I disorder and its phases. The mean age at onset of manic phase of the illness was found to be 22.0 years (median 20.0; S.D.=7.0), 22.5 years (S.D.=7.0; median=21.0) for men and 21.4 years (median=19.0; S.D.=7.3) for women (Fig. 1). The mean age at onset of depressive phase was 23.4 years (median=21.0; S.D.=7.6), 24.1 years (median=24.0; S.D.=7.8) for men and 22.5 years (median=20.0, S.D.=7.3) for women (Fig. 2). There was no significant sex difference in the age of onset of manic ( $t=0.40$ ,  $p=0.3$ ) or depressive phases ( $t=0.40$ ,  $p=0.7$ ). Overall, the mean age at clear recognition of illness was 22.0 years (median=20.0; S.D.=7), 22.3 years (median=21; S.D.=6.6) for men and 21.2 years (med-

Table 2  
Age at onset of bipolar I disorder by sex

Manic onset Years	Male		Female		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
10–15	19	11.7	23	17.7	42	14.4
16–20	57	35.2	55	42.3	112	38.4
21–25	45	27.8	22	16.9	67	22.9
26–30	20	12.3	17	13.1	37	12.7
31–35	14	8.6	4	3.1	18	6.2
36–40	4	2.5	7	5.4	11	3.8
41–45	2	1.2	1	0.8	3	1.0
46–49	1	0.6	1	0.8	2	0.7
Total	162	100	130	100	292	100

Table 3  
Description of course of bipolar I

DSM-IV	Males		Females		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Single manic episode currently in remission	52	31.9	33	25.0	85	28.8
Most recent episode manic in remission	36	22.1	38	28.8	74	25.1
Most recent episode depressed in remission	11	6.7	13	9.8	24	8.1
Most recent episode mixed in remission	7	4.3	10	7.6	17	5.8
Bipolar I disorder single manic episode	14	8.6	7	5.3	21	7.1
Current episode manic <sup>a</sup>	17	10.4	13	9.8	30	10.2
Current episode depressed <sup>a</sup>	21	12.9	14	10.6	35	4.8
Current episode mixed <sup>a</sup>	5	3.1	4	3.0	9	3.1
Total	163	100	132	100	295	100

<sup>a</sup> One or more episodes before enrollment.

ian=19.0; S.D.=7.2) for women. The difference was not significant. Based on lifetime recall, in 22.7% of the cases the illness started with a depressive episode.

Table 3 shows that more than two-thirds of the cases were in remission during enrollment and 35.9% of them had had only one manic episode. Out of all cases who were ill at the time of recruitment 78.0% had at least one previous episode. Overall, 64.1% of the cases had experienced two or more episodes regardless of their status at recruitment. Out of all men 8.6% reported a history of attempted suicide at sometime after the onset of their illness compared to 4.7% of the women (Table 4).

Table 4  
History of suicidal and assaultive behaviors among cases with bipolar I disorder

	Male		Female		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
History of suicidal thoughts ( $n=289$ )						
No	126	78.3	102	79.7	228	78.89
Yes	35	21.7	26	20.3	61	21.11
History of suicide attempt ( $n=290$ )						
No	148	91.9	122	94.6	270	93.10
Yes	13	8.1	7	5.4	20	6.90
History of assault ( $n=283$ )						
No	150	87.7	101	90.2	251	88.7
Yes	21	2.3	11	9.8	32	11.3

About half of the cases had never consulted any form of modern health service facility and only 13.2% of all identified cases had ever been admitted to Amanuel Hospital, the only psychiatric hospital in the country. Only 7.1% of all cases had been on treatment for bipolar I illness that started during the year prior to the survey. Medical treatment given to the cases was classical neuroleptics and none had received mood-stabilizing agents.

#### 4. Discussion

This is the first two-stage cross-sectional study to use standardized and internationally accepted instruments, the CIDI and the SCAN, together with key informants to estimate the lifetime prevalence of bipolar I disorder in a large community population in Ethiopia. The lifetime prevalence estimate of bipolar I disorder reported worldwide is 0.3–3% (Robins et al., 1991; Weissman et al., 1996; Kessler et al., 1997; ten Have et al., 2002; Witchen et al., 1992; Kupfer et al., 2002; Hilty et al., 1999; Szadoczky et al., 1998). The lifetime prevalence of 0.5% in the current study is within this reported range, though it is closer to the lower border. A validation study conducted by Kessler et al. (1997) has indicated that in community-based studies CIDI fails to identify a substantial proportion of the individuals with the symptom profile of bipolar I disorder. Furthermore, emerging research findings suggest that there are subtypes of bipolar spectrum disorders with hypomanic rather than manic features which in the long term could develop into a bipolar I disorder and would not be identified by CIDI (Akiskal, 1996). Therefore, our overall prevalence estimate of 0.5% is likely to be a conservative one arising from rather narrow definition of bipolar I disorder used by the CIDI.

Our finding that men have twice the risk of developing bipolar I disorder compared to women is similar to reports from Edmonton in Canada (Bland et al., 1988), Puerto Rico (Canino et al., 1987; Lee et al., 1990), and New Zealand (Wells et al., 1989). However, it contrasts with other research findings reporting that both genders are affected almost equally by this disorder (Kupfer et al., 2002; Hendric et al., 2000; Hilty et al., 1999; Szadoczky et al., 1998). The difference cannot be explained by selection bias as cases

were identified by door-to-door search where women were more likely to be at home than men during the survey.

Our finding of a mean age at onset is also consistent with other studies (Kessler et al., 1997; Kupfer et al., 2002; Szadoczky et al., 1998; Hendric et al., 2000). The peak age range of onset of bipolar I disorder for both genders was 16–20 years, which is also similar to previous findings (Kupfer et al., 2002; Hendric et al., 2000; Szadoczky et al., 1998).

The elevated prevalence among respondents in the younger age groups could be the result of several factors acting in combination or independently. One such factor could be selection processes such as a higher risk of early death due to high rates of suicide (Tsuang et al., 1980), accidental death (Weeke and Vaeth, 1986), or cardiovascular and respiratory disorders (Sharma and Markar, 1994). In addition, in rural areas of Ethiopia the ever-present poverty and environmental adversity lead to severe malnutrition. In Butajira district, it is common to see individuals with severe mental illnesses dying from malnutrition due to illness related disability to earn living.

The finding that more than two-thirds of the cases were currently ill, or at risk of potential relapse as they had had two or more episodes prior to interview, is not unexpected considering the chronic course of the disorder, which further underscores the disability caused by bipolar I disorder (Taylor and Abrams, 1981; Kessler et al., 1994, 2002). In this study, 59.8% of the cases did not report a depressive episode, in contrast to the ranges (5–28%) reported in clinical studies (Abrams et al., 1979; Wolf et al., 1988; Fogarty et al., 1994). This relatively higher discrepancy between our finding and the results reported by other researchers may be explained by the following three reasons. Firstly, the Butajira sample is community-based, in contrast to most other studies. Secondly, there is a probability of underreporting of milder episodes of depression due to recall problems. Thirdly, depressive symptoms may be perceived as part of normal life (Sandanger et al., 1999) rather than as a psychiatric disorder more often in low income countries than in the industrialized world.

Characterization of the type of episodes experienced by subjects and description of their pattern are

challenging problems in a country such as Ethiopia, where the high illiteracy rate is likely to reinforce a recall problem in terms of time of occurrence. Recall may also be influenced by a person's current emotional and mental state, intensity of the past episode, and recency of the episodes. People in Butajira use important public and religious occasions or other social events to help them remember important personal life events rather than calendar time. Furthermore, general recall errors such as forward telescoping and recomposition of similar episodes into one may hinder the recall of milder or less recurrent episodes (Simon and Vonkorff, 1995).

It cannot be ruled out that cultural and language barriers might have affected the results obtained. But overall, we believe that CIDI performs quite well also in this culture. The CIDI had been translated into Ahmaric and if further translations or clarification were needed during the interviews, the field workers were familiar with region and they had all had extensive training in CIDI interviews. The CIDI has been evaluated in terms of reliability and acceptability in the area in a previous study (Rashid et al., 1996) and previous studies in the area indicate that CIDI is a useful diagnostic instrument also in this setting (Kebede and Alem, 1999; Kebede et al., 2003a,b).

More than half of the study subjects reported that they had never sought modern treatment. About 13.2% reported at least one lifetime admission to psychiatric hospital. Only about 7% of the cases were receiving treatment during the survey, regardless of whether or not they were currently ill. This is the lowest treatment rate we have come across in the literature (Kessler et al., 1997; Kupfer et al., 2002; ten Have et al., 2002).

Possible explanations for not seeking help from the medical services could be geographic inaccessibility as the district is located more than 100 km from the only psychiatric hospital in the country. Lack of money for transport and accommodation even after securing a poverty certificate from local authorities that would entitle them free treatment may also have prevented them from going to the mental hospital. Attribution of the illness to supernatural forces could possibly be an additional explanation for this as many people in Butajira believe such illnesses cannot be helped by modern medicine (Alem et al., 1999).

In two studies from Hungary and Great Britain, the proportion of subjects who have never married or are divorced is high in patients with bipolar disorder (Kupfer et al., 2002; Szadoczky et al., 1998). In our study in Butajira, however, the majority of the subjects were married. This might have different explanations. Firstly, marriage is predominantly arranged by families in this community and it takes place at early age. Secondly, once married it is very difficult for a woman to separate or get divorced. When the never married group was examined in relation to gender separately, men appeared to be never married to a higher extent than their women counterparts (33.7% for men vs. 17.4% for women). Some of the men may have become more disabled and unable to fulfill socially sanctioned requirements to start marital life.

Our finding of a lifetime suicide attempt rate of 6.9% is far below the range reported by other studies (Kessler et al., 1997; ten Have et al., 2002; Kupfer et al., 2002). The explanation for such differences could lie in cultural and religious backgrounds that might hinder or facilitate to talk openly about suicidal thoughts or attempts. In Butajira it is considered brutal and sinful by both Christians and Moslems to take one's own life (Alem et al., 1999). A history of assault in a 2-year perspective was reported by 11%. It might be compared to a US follow-up study on patients discharged from hospital where close to 20% of the patients reported an act of violence in a 1-year perspective (Steadman et al., 1998). A report bias is likely to occur regarding history of violence as well as for family history of mental illness which was reported from 20% of our cases. This latter figure is substantially lower than, for example, those reported by Kupfer et al. (2002). Given the stigma attributed to mental illness in this setting, underreporting should be expected.

## 5. Limitations

Although CIDI has been shown to be reliable in several WHO studies, the validity study conducted by Kupfer et al. (2002) have shown it to have limited sensitivity in detecting bipolar I disorder. Thus, we consider our prevalence estimate to be conservative. Another inherent weakness is, of course, the retrospective design with unavoidable recall problems.

Even though within accepted limits, the non-response rate might have influenced our results.

We have not been able to examine the possible influence of HIV/AIDS on our findings. The prevalence of HIV/AIDS is estimated to be fairly low in this part of Ethiopia and there is nothing in our findings indicating that our results are biased by the infection.

## 6. Conclusion

The lifetime prevalence and age of onset range of bipolar I disorder in Butajira lies within the range found in other studies conducted in the rest of the world. This result, obtained from poverty stricken part of the world with awesome environmental adversities, supports that biological factors are primarily involved in the causation of bipolar I disorder as compared to environmental factors. The difference in prevalence rates among studies (including ours) could probably be attributed to the differences in methodology, and criteria for defining the disorder by researchers.

Our finding that the prevalence of this disorder among men and women appears to be different from many of other studies probably warrants further research.

Overall, our findings support the cross-cultural validity of the diagnostic concept of bipolar I disorder.

Our result has also clearly shown that this disorder attacks people early in life with subsequent relapses in most cases. The majority of the cases are not treated in contrast to most of the cases studied in the developed part of the world, putting them at risk of developing severe disability. The outcome of this recurrent illness, in places with extremely low income with tremendous environmental adversities like in Butajira, will be addressed in the ongoing follow-up study.

## Acknowledgements

Financial assistance for the study was obtained from the Theodore and Vada Institute of Medical Research Awards and the Swedish International Development Agency SAREC/SIDA through the Division of Psychiatry, Department of Clinical Sciences, Umeå University, Sweden. We also thank study subjects and their relatives for their help in the process of data collection.

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