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Magnitude of Mental and Behavioral Disorders in Children and Adolescents in Butajira, Southern Ethiopia

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Dedication

I dedicate this thesis to my father Captain Ashenaffi Chernet and my mother W\o Tsehaynesh Ayele who up brought me supporting in every aspect to reach to such status; and to my eldest brother Dr Issayas Taddesse who shoulder the responsibility of our family and enabled me and other family members be successful both academically and other life aspects by Gods will.

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Abbreviations and definitions

DICA	Diagnostic Interview for Children and Adolescents
DISC	Diagnostic Interview Schedule for Children
DSM	Diagnostic and Statistical Manual
ICD	International Classification of Diseases
BRHP	Butajira Rural Health Project
SAS	Statistical Analysis System
UDA	Urban Dwellers Association
PA	Peasant Association
ADHD	Attention Deficit Hyperactivity Disorder
ODD	Oppositional Deviant Disorder
DD	Depression Disorder
PTSD	Post Traumatic Stress Disorder
CD	Conduct Disorder
WHO	World Health Organisation
CHA	Community Health Agent
TBA	Traditional Birth Attendant
CI	Confidence Interval
Kappa	A measure of relative agreement considering the lowest value as a reference.

Abstract

In order to explore the magnitude of specific mental and behavioural disorders and their socio-demographic correlates in children, a study was conducted in Butajira, Southern Ethiopia, using the Amharic version of the Diagnostic Instrument for Children and Adolescents (DICA). A total of 1477 children were assessed; 3.5 % of the study subjects had at least one or more mental or behavioural disorders. The most frequent diagnoses were anxiety disorder (1.6%), Attention Deficit Hyperactivity Disorder (ADHD) (1.5%); and disruptive behavioural disorder (1.5%). Mood disorders (1%) and elimination disorders (0.8%) were relatively less common. Residence in urban area was associated with ADHD:OR(95 % CI) = 3.03 (1.11-8.04).ADHD was also associated with increasing age, having a single parent, or a chronically sick family member: OR (95 % CI) = 3.32 (1.15-10.33), 4.63(1.25-17.31), 5.56(2.16-14.16), respectively. Disruptive behavioural disorders were significantly associated with increasing age, parents not living together, severe financial problem and with the presence of chronically sick family member OR (95 % CI) =4.41(1.40-15.45),4.63(1.05-17.31),2.77(1.05,7.12), and 8.15 (3.23,20.56), respectively. Living in a house with more than one room was also significantly but inversely, associated with anxiety disorder: OR(95%CI)=0.39 (0.16,0.95). Mood disorders were associated with the presence of parents not living together, financial problem and chronically sick family member: OR (95 % CI) = 4.44 (1.00,18.57), 5.57 (1.82,17.20), and 12.12(3.89,38.84), respectively. Enuresis was found to have no statistically significant association with any of the variables mentioned. Specific mental and behavioural disorders in children were found significant public health problems.

1. Introduction

Mental disorder is defined as a medically diagnosable and recognised illness resulting in a significant impairment of cognitive, affective or relational abilities as a result of biological, developmental and psychological stressors (1). In spite of the importance given to mental health by the World Health Organisation (WHO) as it is included in the definition of health, mental health has so far received relatively inadequate attention, especially in developing countries like Ethiopia (2).

Although children constitute the majority of Ethiopian population, they do not get proper mental health care (3). Moreover, the survival of children is increasingly threatened by war and instability.

Child labour and life on the street is increasing in many countries of Africa, due to economic crisis and migration to urban areas. A substantial proportion of children are out of school and the chance of getting institutional care and of receiving proper attention from the mental health care workers or other social sectors is minimal (4).

Even though there is lack of systematic data on child abuse and neglect, wide-spread excessive child discipline practices, child abandonment and the use of children as a means of begging are all factors likely to contribute to the high occurrence of child mental health problems in Ethiopia (5). Poverty and the tradition which does not allow children to eat with adults, may predispose the child not only to physical illnesses, but also to emotional disorders such as depression and mental retardation. Moreover, there are indicators that child

prostitution and child labour are increasing among adolescents (6).

The use of tobacco, alcohol and khat (Catha edulis) is common and increasing (7). All the above circumstances predispose children to a higher risk of developing psychiatric problems. The low level of children mental health care in Ethiopia is evidenced by: (a) inadequate mental health services available for children, (b) inadequate treatment of the subject in curricula of health professionals training programme, (c) the few number of community-based studies about the extent and determinants of mental health problems, and (d) the negative attitude towards the mentally sick among the community in general and the low priority given to child mental health care by policy makers in particular (7 , 8).

The availability of a valid screening instrument is a prerequisite for the study of mental health problems. The few community surveys of mental health conducted among children in Ethiopia utilised the Reporting Questionnaire for Children (RQC).Although RQC is a good screening instrument, its specificity limits its use in estimating the prevalence of specific mental and behavioural disorders in the community.

The objectives of this study were to describe the magnitude of specific mental and behavioural disorders in children in a rural area, and to determine their socio-demographic correlates, using a structured diagnostic instrument, the Diagnostic Interview for Children and Adolescents (DICA) which was found to have high specificity. The parent version was chosen because of its high reliability and because parents are more accessible in rural settings than children.

2. Literature review

A number of studies on mental health, conducted world-wide, have shown the importance of childhood mental and behavioural disorders. An early epidemiological survey which was conducted in the Isle of Wight in the Caribbean among 10 and 11 year old children in a predominantly rural island reported a prevalence of psychiatric disorders of 6.5 percent; the prevalence was twice higher in boys than in girls and was more frequent in urban areas (9). In another survey in London, using the same method, it was shown that the prevalence of psychiatric disorder was close to 13 percent and varied according to age (9). In Blackburn, an industrial town in England, 6.2 percent of male and 2.2 percent of female children of age 10, were found to have behavioural disorders; among children 12-16 years, 14.6 percent of boys and 11 percent of girls were affected with mental disorder (9). In Australia, where two thousand children were surveyed in the general population, 10 percent of children age 5-12 years, and 16 percent of children 12-16 years were found to have a psychiatric disorder (9). In the Canadian province of Ontario, a representative sample of households from all parts of the province was surveyed and the prevalence of psychiatric disorder found in boys was 19.5 percent in children (4-6 years), 18 percent in children12-16 years, 19.2 percent in the 4-16 years age group, and in girls, 13.5 percent in children, 21.8 percent in adolescents, and 16.9 percent in 4-16 years age groups (10).

The main reason for the difference between the findings in the Island of Wight and Ontario was that in the Island of Wight, the age was limited to 10-11

years and was dominated by a rural population. The Ontario study revealed that there was a marked difference between sexes and prevalence changes as the age increases(9).It was shown that emotional disorder in younger age group was equal for both sexes, whereas it was higher in girls at higher age group. However, for disruptive behavioural disorders, boys had a higher prevalence rate than girls at younger age (9).

A WHO collaborative team has conducted a study to measure the frequency of mental disorder in 952 children attending primary health care in four developing countries using the RQC (11). It was reported that the prevalence rate of mental disorders was 12 percent in the Sudan, 15 percent in the Philippines, 24 percent in India, and 29 percent in Colombia. The sensitivity and specificity of the instrument RQC varied between 89-100 percent, and 62-95 percent , respectively. A 1985 study in rural Senegal which employed RQC conducted among 545 children between the ages of 5-15 years attending a primary health clinic, found that 17 percent were suffering from some form of emotional, behavioural or neuro-psychiatric disorders (12). The RQC in that study had a specificity of 82 percent, and a sensitivity of 76.3 percent. In Kenya, Kangate and Dhadphale (1991) screened 303 children in the age range of 5-15 years using RQC, and found 20 percent of children as having a clinically significant and definable psychiatric disorder (13). The psychiatric morbidity was 77 percent neurotic or emotional disorder, 13 percent conduct disorder, and 10 percent others.

In Ethiopia, very few community-based studies had been reported. In 1968, Giel studied 381 children in the range of 0-20 years using a psychiatric

interview and found a prevalence of mental disorder of 5.2 percent (10). In 1989, Mulatu, using RQC and Child Behavioural and Psychological Questionnaire (CBPQ) on 860 children age 3-12 years, reported a prevalence of psychiatric disorder of 24 percent (14). The study revealed that males were more affected than females as far as maladjustment is concerned, while neurosis were higher in females. There was a higher prevalence of depressive disorder between late childhood and early adolescence. Being poor was found to be one risk factor. Issues like broken house, loose family ties, educational disadvantage and illegal birth put the child at higher risk of developing mental and behavioural disorder. Parent's mental condition and chronic illness was found to be associated with the children mental status. Children with an alcoholic father or mother were found to be more prone to develop psychiatric disorder.

In a 1995, a study in Ambo, Western Ethiopia, a total of 1400 mothers and caretakers were surveyed to enquire about the mental health status of 3,001 children. Over 17.7 percent of children had at least one of the 10 symptoms of RQC. Behavioural disorders were found to be more common in males than in females and the prevalence increased with age. As age increased, the risk also increased (15).The sensitivity and specificity of the instrument was evaluated with a value of 87.5% and 65%,respectively(16).RQC had been a good screening instrument but its specificity, as shown in the study, limits its use in estimating prevalence in the community surveys and also it covers a limited number of problems (cognitive, social and emotional problems). It is a ten item questionnaire for children between the ages of 5-15 years old designed to identify moderate to

severe mental retardation, significant degrees of emotional or behavioural disorder and psychotic disorders. A score of one positive item is generally adequate for screening cases and perhaps pointing towards a particular disorder. It is a "yes" "no" answer questions. Duration and severity of symptoms are not asked.

Recent surveys in developed countries have employed structured diagnostic interviews to collect data (17).Compared with other methods such as self report, questionnaires, direct observations, psychological testing and clinical evaluations, structured interviews have the following advantages:(a) they reduce unwanted sources of errors that might arise from respondents lack of interest or motivation, b)they avoid reading problems, c)they don't need following instructions, and d)their administration is far less expensive.

One of the structured diagnostic instruments, the Diagnostic Interview for Children and Adolescent (DICA) was developed by Herjanic and her associates at Washington University in St Louis, to screen childhood psychiatric disorders (18). In 1989, a revised version of the DICA was developed, patterned after the National Institute of Mental Health (NIMH) Diagnostic Interview Schedule (DISC) and upon DSM-III-R (Diagnostic and Statistical Manual third Revised version). DICA consists of 405 questions, with 20 specific diagnostic options. It has three versions : The first one is for children (6-12 years) and the second for adolescents (13-17 years), and the third version is for interviewing parents or caretakers about their children (5-17 years).

The advantage of structured interviews like DICA are: (a) the instruments are simple to apply; (b) broad disorders are covered; (c) information could be

gathered from different respondents such as parents, children and/or adolescents; (d) they are applied to a wide range of age-span; (e) they are highly structured so that standardisation is facilitated which increases the reliability; (f) it is easy to train interviewers to use them which reduces cost, and (g) the instruments have been shown to be reasonably valid and reliable(19).

A study by Boyle, in 1989, evaluated the DICA reliability and validity on 250 school children. The following information were obtained: a) prevalence estimates, b) test- retest reliability, and c) estimate of inter-respondent agreement between classifications of disorders arising from parent and child/adolescent assessments and trained lay interviewers versus child psychiatrists classification. The prevalence of psychiatric disorder obtained by trained lay interviewers and child psychiatrist, both using DICA, were very similar. Even allowing the child psychiatrist to use clinical probing additionally, had little difference(19). The limitation of the study was using small data and there was no other similar study to set expectation. DICA in other two clinical studies over identified children having high prevalence (oversensitive), when compared to hospital discharge diagnosis and Schedule for Affective Disorders and Schizophrenia (SAD).The reliability showed considerable variability according to respondents and type of disorder. In general, parent assessment yielded more reliable classification than child (6-11years) and adolescent (10-12 years).Child and adolescent assessment of externalising disorders (CD,ODD,ADHD) achieved similar reliability in the "fair" range (kappa, 0.21-0.40), whereas child assessment of internalising disorders (anxiety disorders, depression and dysthymia) were too unreliable compared with

adolescent assessment of same disorder, which yielded kappa estimates in the "moderate" range (0.42-0.60) (19).

Agreement between parent and child/adolescent assessment suggests that overall agreement are low. The exception is one study involving the administration of the DICA to 27 psychiatric inpatient, 7-17 years of age, and their parents. This study generated much higher estimates of child- parent agreement based on kappa ranging from 0.52 to 0.80. The estimates may be inflated since the sample is from inpatients and clinical attention may have focused the perception of respondents and/or it may be due to the severity of presenting problems (17).

Agreement between child psychiatrist administration of DICA and trained lay interviewers suggests a high concordance in the "substantial" range (0.61-0.80) except for anxiety disorders for children and adolescent with kappa 0.21.

Validity studies of DICA show acceptable kappa values for CD (0.43), depression (0.52) and ADHD (0.50),but lower value for anxiety disorders(0.03). Other study by Vietello et al(1990) in 46 inpatient of 6-13 years showed kappa of 0.33 for CD, 0.54 for depression, and 0.30 for ADHD(17). According to Carlson et al (1987), 30 inpatient of 8-12 years were evaluated by a psychiatrist using DICA at admission and using all information at discharge; they found a kappa value of 0.75 for CD, 0.48 for depression and 0.30 for ADHD (17).

DICA has been in use in developed countries for more than two decades. It is, however, the first time that it is applied in community studies in Ethiopia. The reliability, acceptability and feasibility of the instrument have been shown to be

adequate in developed countries and here in Ethiopia (19,24).

The Amharic translated revised version of DICA (parent and child version) was evaluated in Ethiopia for its reliability and acceptability, in1997(24). Percent agreement between lay interviewers and psychiatrists were 89% for any diagnosis, whereas kappa value were found to be 0.78. The lowest kappa value was for dysthymic disorder (0.72), while the highest kappa value is for Manic disorder (1.0).The majority of respondents(clinicians, lay interviewers, outpatients, inpatients and children from the community) judged the DICA-R as being acceptable (24).

Boyle in Canada (1991) studied a sample of 251 school children when he evaluated DICA(19).He classified disorders into mild, moderate and severe forms and found the following prevalence: 3.2 percent of CD, 5.5 percent of ODD, 3.6 percent of ADHD, 6.5 percent of anxiety disorders and 14.5 percent of dysthymia in adolescents (13-18 years). In addition, a prevalence of 0.4 percent of CD, 6.5 percent of ODD, 1 percent of ADHD, 8.4 percent of anxiety disorder and 13 percent of dysthymia was found in children (5-12 years).

Depression, anxiety disorders and dysthymia, which are collectively referred to as internalising disorders, were over-identified by the child or adolescent version of DICA whereas ADHD, ODD and CD, which are known as externalising disorders, were over-identified by the parent version.

Ulzen (1998) in Toronto, Canada studied the extent of morbidity in 98 incarcerated adolescents using DICA. He compared them after matching on sex and age to 49 healthy adolescent controls and found that 60 percent of

incarcerated and 30 percent of healthy controls were affected with at least one psychiatric problem. Physical abuse, substance use and indicators of family adversity were found to be risk factors. Of the adolescents with at least one or more psychiatric problem, 68 percent had two or more psychiatric disorders. Psychiatric co-morbidity was more frequent in females (21).

Myres (1990) studied 49 juvenile delinquents age 13-18 years in Florida, USA, using DICA, and revealed that all of them were affected with one or more psychiatric problems. The average number of current diagnosis of mental problem was 3.4 per subject (16) .

Farmularo (1994) studied 109 children 5-12 years of age appearing before a juvenile court in Boston, Massachusetts, USA who were physically maltreated and ordered to be removed from their parent's custody. He used DICA and found that 35 percent of them were affected with post- traumatic stress disorder PTSD (22).

In another survey of 61 maltreated children 5-10 years of age and 35 controls, higher prevalence of ADHD, PTSD, ODD, CD, mood disorder and psychoses were found in the maltreated group compared to the controls (18).

Kashani (1989) studied 100 adolescents13-18 years in Missouri, USA and found that 42 percent of girls and 19 percent of boys attending out patient clinic in a general hospital were depressed (23) .

A recent study in Ethiopia reported the prevalence of mental disorders in 255 children 5-17 years, sampled from the community and from a psychiatric hospital's outpatient and inpatient departments, conducted as part of reliability

study of the Amharic version of DICA. The following prevalences were reported; phobia: 27.5 percent, conduct disorder: 13 percent, depression: 11 percent, enuresis: 11 percent, mania: 8.6 percent and anxiety disorders: 5.74 percent(24).

Enuresis: In developed countries, 10 percent of 5 year olds, 5 percent of 10-year olds, and 1-2 percent of teenagers have been reported to have enuresis (25). Verhulst (1985) studied 2600 Dutch children between the ages of 4 and 16 years. He found that 17.9 percent of boys and 10 percent of girls have the disease (24). Enuresis was found to be associated with genetic factors which ran in families, with severe mental retardation, neurological development delays and family disorganisation. It is also common in children with emotional disorder, conduct disorder, psychosis or anxiety producing stresses (25).

Depression: depression has been reported to be common in pre-pubertal time. In the study conducted on 2,000 children 10-years of age in the Isle of Wight, 13 percent showed depressive mood but according to the criteria required to be persisting social impairment or handicap, only 0.15 percent had depressive disorders (26). Kashani (1983) studied 9-year olds in New Zealand and found a higher prevalence of 1.7 percent (27). In another study, he found that 2-8 percent of adolescents were affected with depression (27).The sex ratio changed in that before puberty, about twice as many boys as girls were affected, but later, girls were more affected than males. Anderson et al. (1987) found, however, male depression throughout all age groups (26). In boys, family history of alcohol abuse and anti-social behaviour were associated with the problem, while in girls a family history of depression was found to be a risk factor. Age and sex differences

have been ascribed to hormonal changes, genetic factors, increased adverse life events or decrease in protective factors such as loss of social support, changes in the ability to experience depressive cognition or poor reliability of the instrument used (26). Depression overlaps with anxiety, learning problem, hyperactivity, anorexia nervosa, and school refusal (27). Depression was found to be associated with genetic factors and psychological influences (27). Acute life events and chronic difficulties such as parental loss and divorce were reported to be strong risk factors.

Conduct disorder: Different studies have shown that conduct disorder (CD) is common in older children and adolescents. Rutter (1970) in the Isle of Wight found that two-thirds of 10 and 11 year old children with psychiatric disorders were found to have CD (27). In this community study, he found that 4.2 percent of 10-11 year olds were affected. The rate in boys was four times higher than that of girls (27). A similar study in London showed that the magnitude was twice higher than that in the Isle of Wight (27). In Ontario, Canada in 1987, it was revealed that 8.1 percent of 4-16 year boys and 2.8 percent of same age girls were affected with CD (27).

These findings were in agreement with those of Costello (1989) in which male to female ratio decreased with increasing in age. For both sexes, younger children from urban and older children from rural areas were more affected. Socio-economic disadvantages rather than cultural differences between urban and rural sites were ascribed as a reason (20). In the Ontario study, urban and rural rates of CD were 5.6 percent and 5.2 percent, respectively (20). In the study by

Costello, the three most important correlates were, family dysfunction, parental mental illness, and low income; low income affected not adolescents but children in the age 4-11 years(20). According to Rutters (1978), the risk factors for CD were: (i) low socio-economic status, (ii) criminality of father, (iii) over-crowding, (iv) maternal neurosis, (v) chronic marital disturbance, and (vi) institutional care (20). These risk factors were integrated in the study in Mannheim by Blantz et al in1991(27). It was revealed that as the number of risk factors accumulates, the risk of developing conduct disorders increases for boys. In another study, those with CD have associated impairment of school performance, and interpersonal problems (27). Moreover, conduct disorder was associated with complex factors such as constitutional (genetic, chromosomal, intrauterine damage, and birth injury), physical diseases or injury; temperamental factors and environmental factors (20).

United and loving couples were found to be a conducive and protective factors for children not developing CD. However, lack of consistent, permanent and stable caretakers' behaviour, disharmonious parental relationship, history of broken homes in both parents were found to be risk factors (20). In addition, working mothers, brief separation or admission to a hospital, bereavement, father absence, poor fit between personalities of parents and child, large family size, socio-economic disadvantages and interaction between all these factors were found to be strongly correlated with the development of conduct disorder. Psycho-pathology of parent, especially mother's, were strongly associated with conduct disorder. One of the strongest relationships was between alcoholism and antisocial

personality of father and child's mental problem. Marital conflict, low socio-economic status and personality disorder in mothers and psychology of children also had an association (28).

Post Traumatic Stress Disorder (PTSD): There is lack of data concerning prevalence, sex ratio and familial pattern of post traumatic stress disorder (28). The syndrome was formerly under the classification of anxiety, and is usually a result of major stressors. The type, duration, and frequency of trauma determine the extent of prevalence from place to place. Different surveys showed that 10-100 percent of survivors from major stressors developed PTSD (28).

Saigh (1989) studied 860 Lebanese children in the age range of 9-13 immediately after the end of civil war and found out that 54% were affected with PTSD (29). Macksoud (1992) studied 50 Mozambican children 7-15 years of age, all of whom were either kidnapped or witnessed murder in the local war; 25 percent of them were found to develop PTSD (29). UNICEF estimated that 80 % of victims of war are women and children. Therefore, in areas where war has taken place or is ongoing, such as in many least developed countries, significant numbers of individuals are expected (29).

In the 1989 earthquake of San Francisco, Bradburn (1991) found that 27 percent of 22 children 10-12 years old developed PTSD (47). Parry Jone (1991) studied children in Lockerbie, Scotland, after the Pan American plane crashed where 8 adults and 3 children were killed by the debris; it was found that 66 percent of the 54 children assessed after one year developed PTSD (29). A survey of 3,000 North Carolina children in 1991 revealed a prevalence figure of

1.3 percent of PTSD in the general population (29). Other studies found 1 percent of the general population of children were affected with PTSD (29). The reaction for pre-school children was quite different from older ones, and females were more vulnerable than males (29). However, a study in USA showed increased anxiety in boys than in girls; a similar study in the USA found that different effects of gender at different ages (29).

Anxiety Disorders: Many studies have shown that the types of anxiety vary in different age groups. Phobia in childhood, severe performance anxiety in late childhood, and social anxiety in adolescents are usually more common (30). It was also found that anxiety is the most prevalent diagnosis in community surveys. They were not commonly reported in clinical studies probably because they may be considered as less disabling than other disorders (30).Bird (1988) studied in Puerto Rico 777 children 14-16 years old by interviewing both child and parent. He found that 3.5 percent of children were affected (30). Anderson (1987) in New Zealand studied 782 children 11 years old and found a prevalence of 8.7 percent (30). Velez (1988) in United States studied 320 children 9-12 years old by interviewing both parent and children and found prevalence of 25.6 percent, while for adolescents of 13-18 years of age, it was12.7 percent (30).

Mc Gee (1990) in New Zealand studied 962 children age 15 years, using a cross-sectional method and found anxiety disorder between 2 and 5.9 percent (30). Studies have shown that there was high co-morbidity with types of anxieties; conduct disorder, and attention deficit disorder (30). Bernstein found that 30-80 percent of anxiety cases have major depression, whereas two other

investigations failed to show such relation (30). Other studies have shown that genetic influence is minimal, but anxiety was strongly associated with physical diseases and injuries (30). Environmental condition, such as attitudes of parents towards children and the presence of anxious family, were found as risk factors (30). Burke (1990) found that childhood anxiety and that of adults were strongly associated (30). Depressed mothers have reported increased rates of separation anxiety disorder in their children compared to controls (30).

Attention Deficit Hyperactivity Disorder(ADHD): Prevalence differs according to the definition and classification used.The rate reported by the various studies in general population ranges between 3-5 percent (31). Some studies have also shown, using a standardised instrument and parent and teachers report, a prevalence of 14 percent up to 19 percent in primary school age boys (31).

Taylor (1991) in the USA, found that 1.7 percent of boys in primary school had the problem while Gilbert found only 1.3 percent (31). In 1978, Lambert, in the USA, found 1 percent and Sandberg in 1984 in London inner-city found a prevalence of 0.05 percent; those differences may be because of differences in the criteria of diagnosis (31). In China in 1985, the prevalence rate was three times higher than UK (31), and the London inner-city finding was also higher than that of the rural Isle of Wight (31). British prevalence was different from that of the USA. The reason may be because of using different criteria since the Americans used DSM-III criteria whereas the British used ICD-9-classification. The other difference was the difference in the referral system since children referred to British clinics were already low scorers. The Chinese finding

was higher than that of the British probably because of the reportedly stereotype culture of the Chinese, who strongly strive for academic success (31).

In Ontario Canada, Boyle et al (1987) found that city psychiatric prevalence was higher in the city than that of the rural site especially for ADHD. The reason given was cultural differences (31).

In China, however, the reverse was found, with a higher prevalence in rural area. Socio-economic disadvantage instead of cultural differences was attributed as a risk factor. ADHD was found to be less common in girls than in boys. In Ontario, Canada and in London, studies showed a male to female ratio of 2.5 to 1, in Australia 10:1, in a US clinic 4:1 (31). Lack of reliability of rating scale was attributed for the great variability. Differences in prevalence by gender were ascribed to higher tolerance in girls, which leads to underestimation (31). In other studies, however, it was disclosed that hyperactive girls were found less active than hyperactive boys and that neuro-developmental delay in the acquisition of motor, cognitive, language skill in girls may rather be a reason (31).

ADHD was strongly associated with abnormalities in psychological and motor development, such as reduced verbal performance IQ, immature articulation of speech, history of language delay in earlier development, and poor motor co-ordination in skilled tasks (31). Twin studies indicated a genetic component in hyperactivity (31). A severe form of hyperactivity was found to be associated with early history of perinatal problems (31), and neurological illnesses such as ataxic cerebral palsy and epilepsy (31). Poisoning was also found to be a

predisposing factor for ADHD (31). Poverty, bad housing, low socio-economic status and institutional upbringing have been shown to be strong risk factors (31). This was not only due to material disadvantage, but also to change of caretakers or to lack of stable attachments. Hyperactivity was also found in families with marital discord, and hostile parent child relationship (31). Its risk increased with age, and the chance to develop further during adulthood was found to be high (31).

Substance abuse: In the last few decades, alcohol and drug abuse have become a problem both in adolescents in developed and developing countries (32). Prevalences differ from place to place and from time to time. In Ontario Canada in 1983,1,302 adolescents were studied. In the study, occasional tobacco use was reported among 31.1 percent and 45.6 percent of boys and girls, respectively. The prevalence of alcohol use in boys was found to be 42.5 percent, while in girls it was 48.8 percent. There was a strong correlation between parental substance use and children behaviour (32). In Ethiopia, even though systemic data are not available, substance abuse appears to be increasing. Khat (Catha edulis), for instance, is commonly used by older children; in 1991, a survey in Agaro secondary school students revealed that 64% of secondary school students were khat users and the risk of khat dependence was shown to increase with age (7). Both sexes were affected and the age of starting was reported to be between 10 and 11 years. Another survey conducted among Gondar College of Medical Sciences students in 1979 showed a 21% prevalence of khat use (33). Benzene sniffing has also been reported, in Addis Ababa among street children (34).

3. Objectives

General Objective

To measure the magnitude of mental and behavioral disorders in children of a predominantly rural community.

Specific objectives

1. To measure the prevalence of mental and behavioral disorders in children 5-15 years of age, in Butajira, Southern Ethiopia, using DICA.
2. To elucidate the socio-demographic correlates and associated psycho-social stressors.

4. Materials and Methods

This was a cross-sectional study exploring the prevalence of childhood mental and behavioural disorders in a rural community using a structured international diagnostic instrument, the DICA.

The research was conducted between November 1997 and September 1998 in Butajira district of Southern Ethiopia. The district is located 134 kilometres south of Addis Ababa, the capital of Ethiopia. It is administratively divided into 42 peasant associations (PAs) and 4 urban dwellers associations (UDAs). According to 1994 census, it has a population of 272,000,with a male-to-female ratio of 99:100 (35).An average household size is five people. The community predominantly consists of farmers who depend on subsistence farming and houses are predominantly traditional huts built from mud and covered with thatched roof; only a few, relatively wealthier people live in houses with roofs made of corrugated iron sheets. According to the 1994 Census, ''Guragie'' is the dominant ethnic group, while Islam is the major religion .Only 18 percent of children 6-18 years go to school, and literacy rate of the population above the age of 5 years is 24 percent (35).

According to the district agricultural office report, the common products are maize and false banana. Besides Khat, false banana for high-landers and pepper for low-landers are used as cash crops. There is one health centre, two health stations, and 18health posts in the district. A hospital and two health centres are under construction ; a psychiatric clinic has been established in the health centre

and became functional 3 years ago; it is run by two psychiatric nurses.

The study was conducted within the framework of Butajira Rural Health Project (BRHP), which was established in 1987, with the purpose of development and evaluation of a system for continuous registration of vital events, providing a baseline population and sampling frame for health-related studies. The study areas were selected on the basis of probability proportional to the size, to represent both urban and rural populations. Hence, one out of 4 UDAs and nine out of 42 PAs were selected. The BRHP, by 1998, had a population size of 36,000. The BRHP was selected for this study because of its accessibility and other potential resources. Moreover, Amharic is well-spoken by the local community, which made the administration of the Amharic version of DICA feasible.

Sampling: Assuming that the prevalence of mental disorder in children as 10 percent and with 95 percent confidence level and 2 percent error, a sample size requirement of 865 was calculated. Since we planned to measure the prevalence of specific mental and behavioural disorders, a sample size of 1,200 was chosen. This was because specific disorders have a much lower prevalence. Assuming that a village consists of 500 households on average, with at least two eligible 5-15 year old children living in a household, 120 children were expected to be screened in 60 households in each community; these would add up to 1200 in the ten BRHP communities. Every ninth household, hence, was targeted to be our sampling unit.

Training interviewers: Interviewers were recruited from among residents of the communities. All had completed high school, and had field work

experience. There were two supervisors and eight interviewers. Five of the interviewers were females. All were native speakers of the local languages, and were also fluent in Amharic, which was the medium of interview. Intensive training was conducted for one month covering: (a) home study of DICA-R, (b)group interview of a role maker(prime investigator then, lay interviewer) and assessment of uniformity of marking answers, and (c)mock interviews were carried out among the interviewers, and finally pilot interviews of parents with sick children were conducted. The training process was supervised and complemented by a psychiatrist, who had participated in the translation of DICA into Amharic.

Procedure: The translated Amharic version of DICA parent version was used. Parents or care takers of the study children were interviewed.An interview, on average took 120-180 minutes. All questions in the interview were not asked because of the skip rule. In case there was any doubt , questions were repeated; however this rarely occurred. Data collection was conducted by eight interviewers for three months going from house to house. Either of the parents (father or mother), or any other caretakers available, were interviewed. In situations when both father and mother were available, they were asked to choose one of them for the interview. The interview started initially about the older child followed by the younger ones.

In case of absence of all of the care takers, two additional visits were made. If eligible members are absent, adjacent houses in the order of +1,-1 +2,-2 were searched in place of the original house number. Exclusion criteria were

refusal to be interviewed or inability to grant an interview because of a severe illness. Throughout the data collection process, intensive supervision was made by the supervisors and the principal investigator.

There were regular and non-formal meetings of field staffs to discuss problems encountered during data collection. All interviews were edited on a daily basis by supervisors and then by the principal investigator. Data were entered using a software programme of DICA-R which had a capacity of scoring and exporting diagnosis. Statistical analysis was then performed with Statistical Analysis System (SAS).

The study was conducted after an approval by the review committee of both the Department of Community Health and the Faculty of Medicine, Addis Ababa University. The Butajira district council consent was also obtained at the project site.

5. Results

There was a high response rate:99.8percent.A totalof718 care-takers/parents were interviewed about 1,477 children between 5 and 15 years of age. Of these children, 49.4 percent were females and 51.0 percent were in the age group 10 to 15 years (Table 1). Most of the study subjects (98 percent) were from the "Guragie" ethnic group and came from rural areas (86.4 percent). House-holds with large family size (six and above) represented 86.4 percent of households. Majority of the study subjects were Muslims in religion (74.3 percent); had parents who are currently married couples (89 percent), and lived in thatched roof huts 81.2 % which had a single room with no windows .

The most prevalent diagnoses of mental and behavioural disorders were anxiety disorders (1.6 percent), disruptive behavioural disorders (1.5 percent), ADHD (1.5 percent), followed by mood disorder (1percent) and enuresis (0.8 percent).Overall, females were more affected (4.0 percent) than males (3.1percent); as shown in Table 2.

Substance abuse, bulimia and encopresis were rare findings with a prevalence of 0.3 percent, 0.06 percent, and 0.06 percent, respectively. None of the study subjects were reported to have obsession, compulsion, somatization, anorexia nervosa, gender identify crisis or psychosis.

Among the 1477 study subjects, 52 (3.5) percent had at least one psychiatric disorders, out of whom the majority (78 percent) had two or more psychiatric disorders (Table 3).

Residence in urban area was significantly associated with ADHD: OR (95 % CI) = 3.03 (1.11-8.04).ADHD was also associated with increasing age, having a single parent, or having a sick family member: OR (95 % CI) = 3.32 (1.15-10.33), 4.63(1.25-17.31), 5.56(2.16-14.16), respectively (Table4).

Disruptive behavioural disorder was significantly associated with increase in age, the presence of parents not living together, the presence of severe financial problems and the presence of chronically sick family member: OR(95%CI)=4.41(1.40-15.45),4.63(1.05-17.31);2.77(1.05-7.12),8.15(3.23,20.56), respectively (Table5).

Living in a housing with more rooms than one room was also significantly but inversely associated with anxiety disorder: OR(95%CI)=0.39 (0.16,0.95)(Table 6).

Mood disorder was associated with the presence of parents not living together, severe financial problem and the presence of chronically sick family member OR (95 %CI) = 4.44(1.00,18.57), 5.57(1.82,17.20) and 12.12(3.89,38.84), respectively (Table7).

Enuresis was found to have no statistically significant association with any one of the variables mentioned (Table 8).

Table 1. Socio-demographic characteristics of the study children, Butajira, Southern Ethiopia, 1998 (n=1477).

Characteristic		Number (percent)
Age (years)	5-9	724(49)
	10-14	753(51)
Sex		
	Male	748(50.6)
	Female	729(49.4)
Residence		
	Urban	201(13.6)
	Rural	1276(86.4)
Family size		
	Six and above	988(66.9)
	Below six	489(33.1)
Religion		
	Muslim	1097(74.3)
	Others	380(25.7)
Ethnicity		
	Guragie	1447(98.1)
	Others	30(1.9)
Father's education		
	Not literate	1025(69.4)
	Literate	452 (30.6)
Mother's education		
	Not literate	1315(89.0)
	Literate	162(11.0)
Housing condition		
Roof	Thatched	1200(81.2)
	Corrugated	277(18.8)
Room	Single	1151(77.9)
	More	326(22.1)
Window	Absent	1265(85.6)
	Present	212(14.4)

Table 2. Prevalence of mental and behavioural disorders among children in Butajira, Southern Ethiopia 1998

Diagnosis	Frequency (Percent)		
	Male(n=748)	Female(n=729)	Total(n=1477)
ADHD	11(1.5)	11(1.6)	22(1.5)
Disruptive Behavioural Disorder	10(1.4)	12(1.6)	22(1.5)
ODD	6 (1.2)	6 (1.6)	12 (1.4)
CD	4 (0.7)	6 (0.8)	10(0.5)
Anxiety Disorder	10 (1.3)	14 (1.9)	24 (1.6)
General anxiety	2 (0.4)	5 (0.8)	7 (0.5)
Phobia	4 (0.5)	7 (0.9)	11 (0.7)
PTSD	4 (0.5)	5 (0.8)	9 (0.6)
Mood Disorders	6 (0.8)	9 (1.3)	15 (1.0)
Major depression	5 (0.6)	9 (1.2)	14 (0.9)
Dysthymia	3 (0.3)	3 (0.7)	6 (0.4)
Mania	3 (0.5)	2 (0.2)	5 (0.3)
Eliminative disorders	4 (0.5)	8 (0.1)	12 (0.8)
Enuresis	4 (0.5)	8 (1.1)	12 (0.8)
Encopresis	1 (1.09)	0 (0)	1 (0.1)
Substance use	3 (0.5)	1 (0.1)	4 (0.3)
Any DSM-III-R Diagnosis	*23(3.1)*	*29(4.0)*	*52 (3.5)*
Total	*748*	*729*	*1,477*

Table 3. Comorbidity of mental and behavioral disorders among children, in Butajira, Southern Ethiopia, 1998.

Number of Disorder per child	Frequency(Percent)	Cumulative Frequency
1	11(21.2)	21.2
2	9(17.3)	38.5
3	8(15.4)	53.9
4	8(15.4)	69.3
5	8(15.4)	84.7
6	5(9.6)	94.3
7	3(5.7)	100
Total	52 (100)	–

Table 4. Socio-demographic correlates of Attention Deficit Hyperactivity Disorders (ADHD) in children, Butajira, Southern Ethiopia, 1998.

Characteristics			Number (percent) With disorder	Without disorder	Odds ratio (95 % Confidence interval)
Age (years)	*5-9*		5 (0.69)	719	1.0
	10-14		17 (2.26)	736	3.32(1.15, 10.33)
Sex	Male		11 (1.47)	737	1.0
	Female		11 (1.51)	718	1.03 (0.41, 2.56)
Residence:		Rural	15 (1.18)	1,261	1.0
		Urban	7 (3.48)	194	3.03 (1.11, 8.04)
Family size		Below six	8 (1.64)	481	1.0
		Six and above	14 (1.42)	974	0.86 (0.34, 2.26)
Religion		Muslim	15 (1.37)	1,082	1.0
		Others	7 (1.84)	373	1.35 (0.50, 3.56)
Father's education					
	Not literate		12 (1.17)	1,013	1.0
	Literate		10 (2.21)	442	1.91 (0.82, 4.44)
Mother's education					
	Not literate		17 (1.29)	1,298	1.0
	Literate		5 (3.09)	157	2.43 (0.77, 7.13)
Housing condition					
	Roof	Thatched	15 (1.25)	1,185	1.0
		Corrugated	7 (2.53)	270	2.05 (0.75, 5.41)
	Room	Single	14 (1.22)	1,137	1.0
		More	8 (2.45)	318	2.04 (0.78,5.24)
	Window	None	16 (1.26)	1,249	1.0
		One or more	6 (2.83)	206	2.27 (0.79, 6.27)
Social stressors					
	Parents living together				
		Yes	19 (1.33)	1,407	1.0
		No	3 (5.88)	48	4.63 (1.25, 17.31)
	Severe financial problem				
		No	15 (1.23)	1,205	1.0
		Yes	7 (2.72)	250	2.25 (0.82, 5.94)
	Bereavement				
		No	18 (1.43)	1,243	1.0
		Yes	4 (1.85)	212	1.30 (0.37, 4.13)
	Chronically sick family member				
		Not Present	13 (0.99)	1,294	1.0
		Present	9 (5.29)	161	5.56 (2.16, 14.16)

Table 5. Socio-demographic correlates of Disruptive Behavioural Disorders (Conduct and Oppositional Deviant Disorders) in children, Butajira, Southern Ethiopia, 1998.

Characteristics		Number (percent)		Odds ratio
		With disorder	Without disorder	(95 % Confidence interval)
Age (years)	*5-9*	*4 (0.55)*	720	1.0
	10-14	18 (2.39)	735	4.41 (1.40, 15.45)
Sex	Male	10 (1.34)	738	1.0
	Female	12 (1.65	717	1.24 (0.50, 3.10)
Residence:	Rural	16 (1.25)	1,260	1.0
	Urban	6 (2.99)	195	2.42 (0.84, 6.68)
Family size	Below six	6 (1.23)	483	1.0
	Six and above	16 (1.62)	972	1.33 (0.48, 3.81)
Religion	Muslim	17 (1.55)	1,080	1.0
	Others	5 (1.32)	375	0.85 (0.27, 2.46)
Father's education				
Not literate		13 (1.27)	1,012	1.0
Literate		9 (1.99)	443	1.58 (0.62, 3.98)
Mother's education				
Not literate		18 (1.37)	1,297	1.0
Literate		4 (2.47)	158	1.82 (0.52, 5.81)
Housing condition				
Roof	Thatched	16 (1.33)	1,184	1.0
	Corrugated	6 (2.17)	271	1.64 (0.57, 4.50)
Room	Single	15 (1.30)	1,136	1.0
	More	7 (2.15)	319	1.66 (0.61, 4.38)
Window	None	17 (1.34)	1,248	1.0
	One or more	5 (2.36)	207	1.77 (0.57, 5.18)
Social stressors				
Parents living together				
	Yes	19 (1.33)	1,407	1.0
	No	3 (5.88)	48	4.63 (1.05, 17.31)
Severe financial problem				
	No	14 (1.15)	1,206	1.0
	Yes	8 (3.11)	249	2.77 (1.05, 7.12)
Bereavement				
	No	17 (1.35)	1,244	1.0
	Yes	5 (2.31)	211	1.73 (0.55, 5.06)
Chronically sick family member				
	Not Present	11 (0.84)	1,296	1.0
	Present	11 (6.47)	159	8.15 (3.23, 20.56)

Table 6. Socio-demographic correlates of Anxiety Disorders (Phobia, General Anxiety and Post-traumatic Stress Disorders) in children, Butajira, Southern Ethiopia, 1998.

Characteristics		Number (percent)		Odds ratio
		With disorder	Without disorder	(95 % Confidence interval)
Age (years)	5-9	12 (1.66)	712	1.0
	10-14	12 (1.60)	741	0.96 (0.40, 2.30)
Sex	Male	10 (1.34)	738	1.0
	Female	14 (1.92)	715	1.45 (0.60, 3.52)
Residence:	Rural	18 (1.40)	1,258	1.0
	Urban	6 (3.00)	195	2.15 (0.75, 5.83)
Family size	Below six	4 (0.82)	485	1.0
	Six and above	20 (2.02)	968	2.51 (0.80, 8.70)
Religion	Muslim	18 (1.64)	1,079	1.0
	Others	6 (1.58)	374	0.96 (0.34, 2.59)
Father's education				
Not literate		13 (1.27)	1,012	1.0
Literate		11 (2.43)	441	1.94 (0.81, 4.65)
Mother's education				
Not literate		19 (1.44)	1,296	1.0
Literate		5 (3.09)	157	2.17 (0.70, 6.27)
Housing condition				
Roof	Thatched	16 (1.33)	1,184	1.0
	Corrugated	8 (2.89)	269	2.20 (0.85, 5.52)
Room	Single	10 (3.07)	316	1.0
	More	14 (1.22)	1137	0.39 (0.16, 0.95)
Window	None	19 (1.50)	1,246	1.0
	One or more	5 (2.36)	207	1.58 (0.51, 4.56)
Social stressors				
Parents living together				
	Yes	21 (1.47)	1,405	1.0
	No	3 (5.88)	48	4.18 (0.96, 15.98)
Severe financial problem				
	No	18 (1.48)	1,202	1.0
	Yes	6 (2.33)	251	1.60 (0.56, 4.31)
Bereavement				
	No	19 (1.51)	1,242	1.0
	Yes	5 (2.31)	211	1.55 (0.50, 4.45)
Chronically sick family member				
	Not Present	19 (1.45)	1,288	1.0
	Present	5 (2.94)	165	2.05 (0.66, 5.93)

Table 7. Socio-demographic correlates of Mood Disorders (Major Depression, Mania and Dysthymia) in children, Butajira, Southern Ethiopia, 1998.

Characteristics		Number (percent) With disorder	Without disorder	Odds ratio (95 % Confidence interval)
Age (years)	5-9	4 (0.55)	720	1.0
	10-14	11 (1.46)	742	2.67 (0.78, 9.97)
Sex	Male	6 (0.80)	742	1.0
	Female	9 (1.23)	720	1.55 (0.50,4.90)
Residence:	Rural	13 (1.02)	1,263	1.0
	Urban	2 (1.00)	199	0.98 (0.22, 4.30)
Family size	Below six	4 (0.82)	485	1.0
	Six and above	11 (1.10)	977	1.37 (0.40, 5.10)
Religion	Muslim	12 (1.09)	1,085	1.0
	Others	3 (0.79)	377	0.72 (0.16, 2.75)
Father's education				
Not literate		10 (0.98)	1,015	1.0
Literate		5 (1.11)	447	1.14 (0.34, 3.63)
Mother's education				
Not literate		12 (0.91)	1,303	1.0
Literate		3 (1.85)	159	2.05 (0.45, 7.89)
Housing condition				
Roof	Thatched	13 (1.08)	1,187	1.0
	Corrugated	2 (0.72)	275	0.66 (0.10, 3.11)
Room	Single	12 (1.04)	1,139	1.0
	More	3 (0.92)	323	0.88 (0.20, 3.37)
Window	None	14 (1.11)	1,251	1.0
	One or more	1 (0.47)	211	0.42 (0.02, 3.08)
Social stressors				
Parents living together				
	Yes	13 (0.91)	1,413	1.0
	No	2 (3.92)	49	4.44 (1.00,18.57)
Severe financial problem				
	No	7 (0.57)	1,213	1.0
	Yes	8 (3.11)	249	5.57 (1.82, 17.20)
Bereavement				
	No	13 (1.03)	1,248	1.0
	Yes	2 (0.93)	214	0.90 (0.10, 3.95)
Chronically sick family member				
	Not Present	6 (0.46)	1301	1.0
	Present	9 (5.29)	161	12.12 (3.89, 38.84)

Table 8. Socio-demographic correlates of Enuresis in children, Butajira, Southern Ethiopia, 1998.

Characteristics			Number (percent) With disorder	Without disorder	Odds ratio (95 % Confidence interval)
Age (years)	5-9		8 (1.06)	745	1.0
	10-14		4 (0.55)	720	0.52 (0.13, 1.90)
Sex	Male		4 (0.53)	744	1.0
	Female		8 (1.10)	721	2.06 (0.56, 8.17)
Residence:		Rural	9 (0.71)	1,267	1.0
		Urban	3 (1.49)	198	2.13 (0.45, 8.65)
Family size		Below six	5 (1.02)	484	1.0
		Six and above	7 (0.71)	981	0.69 (0.20, 2.51)
Religion		Muslim	11 (1.00)	1,086	1.0
		Others	1 (0.26)	379	0.26 (0.01, 1.94)
Father's education					
	Not literate		7 (1.55)	445	1.0
	Literate		5 (0.49)	1,020	0.31 (0.09, 1.10)
Mother's education					
	Not literate		11 (0.83)	1,303	1.0
	Literate		1 (0.61)	162	0.73 (0.10,5.64)
Housing condition					
	Roof	Thatched	9 (0.75)	1,191	1.0
		Corrugated	3 (1.08)	274	1.45 (0.31, 5.86)
	Room	Single	9 (0.78)	1,142	1.0
		More	3 (0.92)	323	1.18 (0.25, 4.76)
	Window	None	10 (0.79)	1,255	1.0
		One or more	2 (0.94)	210	1.20 (0.26, 5.41)
Social stressors					
	Parents living together				
		Yes	11(0.77)	1,414	1.0
		No	1(1.92)	51	2.52 (0.33, 18.94)
	Severe financial problem				
		No	10 (0.82)	1,210	1.0
		Yes	2 (0.78)	255	0.95 (0.21, 4.31)
	Bereavement				
		No	9 (0.71)	1,252	1.0
		Yes	3 (1.39)	213	1.96 (0.46, 7.94)
	Chronically sick family member				
		Not Present	8 (0.61)	1,299	1.0
		Present	4 (2.35)	166	3.91 (0.98, 14.48)

Discussion

The study has shown that of1477 children, 3.5 percent of children had one or more mental or behavioural disorder. This reveals that there is a considerable number of psychiatric problems among children.

In developed countries, different studies using different kinds of methods and samples have shown that 5-15 percent of children age 3-15 years were affected with psychiatric problem; in developing countries, similar figures have also been shown. WHO studies in developing countries, using RQC, showed a range of 15-29 percent, in primary health facilities; in Kenya, it was 20 percent and in Senegal 17 percent (11).Giel (1968), in Ethiopia, studied 383 children ,0-20 years of age, by psychiatric interview and found that 5.2 percent of them were affected with mental and behavioural disorders (10). In Ethiopia, using RQC method, it was found that 21 percent of boys and 25 percent of girls, were affected with psychiatric problem(14). A recent study in Ethiopia found about 17 percent in a community survey using RQC(15). The differences between the results of the present study and those mentioned above may be due to the fact that most of the other studies mentioned were clinical (WHO, Kenya, Senegal) so that they may lack representation ,and they have mostly used the RQC which has been shown to be less specific(15)

In our study, females were slightly more affected than their male counterparts, 4.0 percent and 3.1 percent, respectively. This finding is not consistent with most community surveys conducted elsewhere, except Mulatu's in Ethiopia (14). Many studies showed that males were more affected than

females (9,13,14).Sex comparison of specific disorders in the recent study reveals that for ADHD,ODD, and CD, the difference was minimal. The difference was higher for mood disorders and anxiety disorders. Nonetheless, in our study, the difference was not statistically significant as shown from the odds ratio calculated. Our findings are consistent with Megerssa's (1997) recent study in Ethiopia, in which he found phobia, conduct disorder, depression, mania, anxiety disorder and enuresis were common, while other disorders were not reported (24).

In our study, 41(78.8 percent of the 52 cases had two or more specific psychiatric disorders, which shows that approaches towards a mentally sick child should be extensive, with interventions addressing all co-morbid disorders. Ulzen, in Canada, found that 63 percent of incarcerated and mentally affected children had two or more psychiatric disorders, which is consistent with our finding (21). Myres, in the USA also revealed that patients with conduct disorder had additionally ADHD and substance abuse(16).

The prevalence of anxiety disorders reported in this study is lower than other reports (17,19).Lower prevalence in the present study could be explained by the fact that, as several studies have revealed, parents may be less informative about their children anxiety status as this is internalising disorder, or that the extended family system in the community might be a protective factor that soothes anxieties or it may also be a reflection of the type population studied.

In different studies, history of anxious family, poor attitude of parent to the child and genetic factors were ascribed as risk factors for anxiety disorders. In our study residing in a house with more rooms than single room was associated

risk factor was found a protective factor.

The magnitude of ADHD in the study subjects was similar with most community surveys so far conducted. Gilbert and Taylor (31) found that marital problem, poverty, bad housing conditions and genetic factors were associated with ADHD. These findings are consistent with ours but housing condition and financial problems in our survey did not show a significant association with ADHD. It is out of the scope of this study survey to explore genetic causes, so we couldn't rule them out as possible risk factor.

The prevalence of disruptive behavioural disorders reported in the present study is lower than developed countries (18,27).The small prevalence in our may be due to cultural differences between the populations. The attitude of a community towards misconduct, especially in rural areas, may lead to under reporting. Moreover, male child in the younger age groups, showing misconduct may be considered as normal behaviour.

In Isle of Wight and Ontario Canada, prevalence of disruptive behavioural disorder in males was four times that of females (27). Tadesse (1997) also showed this variation (15). The finding here of similar prevalence between males and females might again be attributable to the facts that: (a) male misconduct may be under-reported ; or (b) females may have rather higher disruptive problems than males, due to the more stressful up-bringing environment such as heavy work load and early commitment to engagement and marriage, which may predispose female child to develop more problems than male counter-part. However, like all other studies, we showed that disruptive behavioural problem increased with age.

This may be attributed to biological and social changes against the poor coping mechanisms of the growing child, or the poor family readiness and capacity to assist children.

In our study, those from older age groups, separated parents, the presence of severe financial problems and chronically sick family member were associated with behavioural problems. Costello and Rutter (27) found that family dysfunction, chronic marital disturbance, parental mental illness, low income, criminality of father, overcrowding and lack of institutional care were risk factors which were consistent with ours, though big family size and crime history were not found to be risk factors.

In this study, living in a house with single room was associated risk factor while in the above mentioned studies history of anxious family; poor attitude of parent to child, and genetic factors were ascribed as risk factors .Whether there is a positive anxious family history of parents was not determined since we did not study the parent's mental status.

Mood disorders were less common in our study than other studies (19,22). This may be attributable to: (a) the different culture of a traditional society which may have a strong coping mechanism to bereavement, or (b) parents may not be best informant for internalising disorders such as mood disorder.

The male to female prevalence difference of mood disorders in our study was minimal. But, in other community surveys like Kashani, depression increases with age and is higher in boys before puberty and increases in girls after puberty (26). Comparison of sex difference before and after puberty was not possible since

our study is limited below 15 years. Moreover, female children may be out of parent's custody, due to marriage, which may have an effect on the estimation of the prevalence ratio.

The presence of parents not living together, severe financial problems and sick family member were attributed as risk factors for mood disorders. In Rutter findings, mainly acute and chronic life events such as divorce, death were found to be risk factors (27). Bereavement was not found a risk factor indicating that tragedy and other life crisis may be well shared among traditional society of Butajira .

In our study, the prevalence of enuresis was found to be only 1 percent. Verhulst, after studying 2600 Dutch children at the age of 5, found that 17 percent of boys and 10 percent of girls were affected. Other surveys also showed that 10 percent children wet their bed by the age of 5 years, 5 percent by the age of 10 years, and 1-2 percent by their teenage years (22.18).Other than developmental reasons which are difficult to know at this juncture, differences in culture may be the cause of difference. Concerning the male female ratio, the male child in the rural community culture, after the age of 6 or 7, he sleep alone and the habit of changing clothes frequently by parents is weak which may lead to under information. Moreover wetting may predispose to high stigma. All these may lead to under estimation.

In Verhurst's study, physical illness, inconsistent toilet training and developmental factors were strongly correlated with enuresis (25). We found that non of the variables mentioned were found to have statistically significant

association with enuresis. Since we did not have the mechanism to explore developmental reasons or the status of upbringing such as how toilet training was performed in rural settings, we could not rule these conditions as risk factors.

The internal validity of our study was maintained by the random selection of samples and the large sample size which may decrease chance factor; lay interviewers were used which may decrease interviewer bias. The use of highly structured interview, coupled with a thorough training of interviewers in its use, and with pilot interview of parents have also strengthened the reliability.

Limitations of the study include the lengthy interview that may invite recall bias. As noted earlier, the time taken to complete the interview ranged between 120-160 minutes. Even though there is a portion in the DICA which enquires parents about their response about the interview and none of them have complained, it is possible that they may have uneasiness. Moreover, they may be concerned about their daily busy work. A second limitation relates to the impacts and influences of previous studies that may lead to social desirability or undesirability bias, which may inflate or deflate the response. Continuous and repeated vital events registration and a number of different research activities being undertaken in the area may cause losing interest in the subjects or vice versa. Ongoing studies may increase interest when subjects so far involved in other surveys relate the interview to some form of compensation such as treatment of the sick or transport allowance for those appointed to the local health centre after initial screening. A third limitation is in the use of cross sectional study method which may lead to cause-effect relationship dilemma: for example,

stresses such as divorce may be a risk factor for the development of mental and behavioural problems, or behavioural problems by themselves may be causes for stresses such as divorce.

7. Conclusions

1. Specific mental and behavioral disorders were found in 3.5 percent of children studied in Butajira and most of them had two or more psychiatric disorders.

2. Social stressors such as parental separation and severe financial problem were shown to be associated with mental and behavioral disorders in children.

8. Recommendations

1. There is considerable mental and behavioral disorders among the predominantly rural children in Butajira. The present curative mental health care at the health center must be strengthened and further decentralized to the health post levels.
2. Preventive and promotion work has to be initiated to increase the awareness of the community about mental health and bring the necessary changes through health education at all levels: from central referral hospital by professionals, to the health post level by the community health agents and traditional birth attendants, after adequate training.
3. The growing female child must get special attention.
4. The effects of severe financial problems, divorce and urbanization on children's mental status must be properly addressed by the community, government and other concerned organizations.
5. Other surveys using different versions of DICA must be conducted in different rural communities so that the quality and quantity of information already obtained may increase and become valuable input to children's mental health development.

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DECLARATION

I, the undersigned, declare that this thesis is my original work, has not been presented for a degree in any other university and that all resources of material used for this thesis have been fully acknowledged.

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Date of admission January 1999

This thesis have been submitted for examination with my approval as the university advisor.

Dr. Derege Kebede _____ 25 Feb 99.