Functional disability and associated factors among patients with severe mental illness attending psychiatry outpatient unit at Ayder comprehensive specialized hospital, Mekelle, Ethiopia: a cross-sectional study.

Tesfalem Amare (✉ tesfaye.araya@yahoo.com)

Mekelle University College of Health Sciences

Natnael Seifu

Mekelle University

Mirkat Shewangzaw

Mekelle University

Primary research

Keywords: functional disability, severe mental illness, Mekelle, Ethiopia

Posted Date: March 25th, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-18550/v1>

License: This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Abstract

Background According to the World Health Organization (WHO), functional disability associated with severe mental illnesses was pervasive, affecting everyday life, and has a significant contribution to the global functional disability. The severe mental illnesses (schizophrenia, major depressive disorder, and bipolar disorder) were among the top ten leading causes of functional disability as indicated by years lived with a functional disability. These illnesses hurt the academic, occupational, social and family functioning of the patients. Despite this fact, functional disabilities and its contributing factors among severe mental illness were not clear. Therefore this study will assess the prevalence and associated factors of functional disabilities among patients with severe mental illnesses.

Methods Institutional based cross-sectional study was conducted from Feb 03 to March 10, 2020, with a total of 423 participants in Mekelle, Ethiopia. A stratified random sampling method was included in the study. Functional disabilities were measured by WHO functional disability assessment schedule version two (WHODAS 2.0). Bivariate and multiple logistic regression analyses were performed to determine the association between independent and dependent variables.

Results The prevalence of functional disability among severe mental ill patients was 88.1% (51.3% mild, 27.5% moderate & 9.3% severe functional disabilities). This study revealed that, being jobless [AOR=4.01, 95% CI (1.77, 12.35)], duration of illness ≥ 11 years [AOR=2.99, 95% CI(1.17,7.64)], those who had poor treatment adherence [AOR= 2.79, 95% CI (1.06, 7.35)], drug adverse effects [AOR= 4.61, 95% CI (1.79, 11.84)], poor social supports [AOR=6.58, 95% CI (2.01, 21.56)], and moderate social supports [AOR=4.16, 95% CI (1.88,9.20)] were significantly associated with functional disabilities.

Conclusion The prevalence of functional disability was found to be high. Being jobless, duration of illness ≥ 11 years, medication non-adherent, having drug side effects and having poor or moderate social support were significantly associated with functional disabilities. Therefore, when treating patients with severe mental illness giving especial attention the bio-psycho-social aspect of treatment is essential.

Introduction

Functional disability refers to impairment' are it physical, sensory, intellectual, or mental. A person may be considered as disabled if he or she has a condition that affects the ability to function without an assistant at the level needed to maintain well-being (1).

WHO (World Health Organization) developed the International Classification of functioning (ICF) disabilities and health. According to the ICF, functional disability is defined as "a difficulty in functioning at the body, personal or societal levels, in one or more life domains, as experienced by an individual with a health condition in interaction with contextual factors"(2).

The term Psychiatric disability used when mental illnesses significantly interfere with the performance of one or more major life activities, such as the ability to live independently, work, attend school, or manage

basic activities of daily living(3, 4).

Worldwide neuropsychiatric conditions are the most important and among the leading causes of functional disability (5, 6) with a total of 13% of the burden of diseases, and account for 31% of the world's functional disability (5, 7). This total functional disability was largely contributed by five major psychiatric conditions: major depression disorder (11•8%), alcohol-use disorder (3•3%), schizophrenia (2•8%), bipolar disorder (2•4%), and dementia (1•6%). These illnesses hurt the academic, occupational, social and family functioning of the patients (7, 8).

One in four people in the world will be affected by mental or neurological disorders at some point in their life. About 450 million people suffer from such conditions, placing mental disorders among the leading cause of ill health and Functional disability worldwide (7, 9).

The severe mental (schizophrenia, major depressive disorder, and bipolar disorder) (10, 11) are significantly associated with functional impairments/disabilities (10–14).

Schizophrenia is a chronic condition associated with a high level of functional disability among the most disabling disorder worldwide (7, 13, 14). Patients with schizophrenia have also difficulty succeeding at school, obtaining or maintaining a job, having social relationships(8, 10), living independently(13), and, even for some, taking care of their basic daily needs (8, 11).

On the other hand, major depressive disorder is the most responsible for social and functional impairments globally (14–16). According to WHO (2001), by 2020, depression is predicted to be the 2nd highest global burden of disease and will account for 5.7%, and by 2030 in the first disease burden (DALYs) by contributing 6.2% (17, 18).

Bipolar disorder is a common, chronic, episodic and severe mood disorder that is one of the leading causes of functional disability worldwide (19). Importantly, schizophrenia, depression, and bipolar disorder remained in the top 10 causes of lost DALYs across important subgroups, including men, women, developed countries, and developing regions of the world (7, 15).

Despite this significant functional disability resulted from severe mental illness, the study done in this area is very rare. Therefore, this study aims to assess the prevalence of functional disability among severe mental illness patients in Ayder comprehensive specialized hospital, psychiatry outpatient, Mekelle, Ethiopia.

A community-based cross-sectional study conducted in Canada shows schizophrenia has a more direct effect on neuro-cognitive impairment than that of bipolar disorder, but in both cases, the magnitude of functional disability found to be high (8).

A cross-sectional study in Barcelona indicates, 60% of bipolar patients show overall functional impairment using a functioning assessment short test (FAST), and another study conducted in Spain using the same tool revealed that BPD patients experienced a sustained impairment in different areas of

psychosocial functioning (20)(21). A study conducted in Finland on schizophrenia showed that impairment in social functioning was present in more than 80% of the patients (22).

A community-based cross-sectional study from Australia in various mental disorders revealed that severe form of depression is among the disorders which cause severe & independent functional disability with 4% mild, 30% moderate, and 62% severe functional disability (23).

The study among Chinese people found that the prevalence of functional disability living with SMIs was as high as 69.6%. Older age and longer duration of hospitalization were risk factors related to functional disability (24).

A cross-sectional study from china among schizophrenics, which assess the prevalence of functional disability using WHODAS II, shows that 74 (73.3%) were disabled; among them, 71(70.3%) had a mild functional disability, 2(1.9%) had moderate functional disability, and one had an extreme functional disability (25).

Another hospital-based cross-sectional study from China on schizophrenic patients, shows female have higher level of functional disability than their male counterpart in all domains of WHO DAS – 2(26).

A study done in India shows, (64%) of schizophrenic patients, (25%) of the BPD, and (57%) MDD patients with 2 to 5 years illness showed mild functional disability, followed by moderate functional disability (27%) of schizophrenia, (50%) of the BPD, and (43%) of MDD, while severe functional disability (9%) of schizophrenia patients, and (25%) of the BPD. The functional disability is stable with an increase in the duration of illness (28).

Patients even in mild depressive symptoms appear to function significantly worse than do in patients with several other chronic medical illnesses, and increased service utilization and social morbidity (29).

A study done in Nigeria shows that, schizophrenia with moderate to severe functional disability scored in the majority of participants in social activities and occupational domain of functionality (30).

Assessment of functioning of people with major depressive disorder, in Uganda, showed higher functional impairment, which is significantly associated with severity of symptoms (33).

In Ethiopia, 11% of the total burden of diseases was schizophrenia and depression (34). A study done in Butajira, Ethiopia, by using the SF-36 scale, revealed that 52–86% with recent-onset and 35–47% with enduring onset of the bipolar patients found having social and physical functional impairments, respectively (38).

Another study in Butajira and Ziway area showed longstanding illness (2 years and above) had higher functional impairment predominantly social and physical functioning (39).

According to the two studies in Spain, functional impairment in bipolar patients was significantly associated with age, depressive symptoms, number of previous manic episodes, number of previous

mixed episodes, and number of previous hospitalizations (20).

A study from China in people living with severe mental illnesses revealed that: older age was a significant risk factor for functional disability, and shorter duration of current hospitalization was a significant protecting factor for functional disability (24).

Studies from China revealed that high levels of functional disability are positively correlated with an early age of onset, a longer duration of illness, poor social support frequency of admission, being female were significant association functional disability (25) (26).

According to the studies in India, there was no increase in the functional disability with longer duration of illness (18),

Studies from Africa regarding schizophrenics, factors such as being female, poor response to initial treatment and longer duration of illness, symptom severity and non-compliance on maintenance treatment found to be significantly associated with functional disability (30)(31)

Among people with depression; duration of illness, the presence of co-morbid somatic or mental disorders, the severity of symptoms leads to functional disability (28) (29) (33).

In Ethiopia, a study from Butajira on SMIs, lack of social support and substance use, which are all lead to deterioration of functioning (35). The study in Butajira and Ziway on bipolar cases found that the severity of depressive and manic symptoms was associated with functional impairment, while male sex, rural residence and being married were associated with better functional outcomes (38, 39).

Although functional disability resulting from severe mental illness is enormous, it is grossly under-represented, which tends to focus on mortality rather than morbidity or dysfunction, especially in low and middle-income countries.

Assessing the prevalence and associated factors of functional disability among SMIS patients should be considered as an inevitable component of management.

Methodology

Study area and period

This study was conducted at Ayder Comprehensive Specialized Hospital, Mekelle, Ethiopia. Mekelle is located in Tigray regional state 783 km away from Addis Ababa, the capital city of Ethiopia. Psychiatry services of the hospital were provided by a psychiatrist, general practitioner, integrated clinical and community mental health professionals, psychiatry professionals, and clinical psychologists. The current flow of psychiatric patients on average was 946 patients per month. This hospital had 24 beds for inpatient and 4 OPDs for outpatients. The study was conducted from Feb 03 to March 10, 2020.

Study Design

An institutional-based cross-sectional study was conducted.

Source and Study population

Source population

All patients with severe mental illness, who diagnosed as schizophrenia, major depressive disorder, and bipolar disorder according to DSM-V at Ayder comprehensive specialized hospital

Study population

Patients with severe mental illness, who have a regular follow-up at Ayder comprehensive specialized hospital during the study period, were included.

Eligibility criteria

Inclusion criteria

All patients with severe mental illness with age 18 years and above, who have a regular follow-up at Ayder comprehensive specialized hospital receiving treatment for at least a year were included.

Exclusion criteria

Those who were unable to communicate had decision incapacity, and in acute condition were excluded from the study.

Sample Size and sampling technique

Sample size

The minimum number of samples required for this study was estimated by a single population proportion formula. Since there is no study done, taking 50% prevalence, with a 5% margin of error, and 95% confidence interval the final sample size was 423, by adding a 10% non-response rate.

Sampling technique and procedures

A stratified random sampling technique was employed. Patients who were on follow up from outpatient at ACSH during the study period were divided into three groups based on their diagnosis like schizophrenia, MDD & bipolar disorder. The systematic random sampling technique was used to select samples. The samples were drawn proportionally from each stratum using the following formula. The sample was selected every 18 patients (**Fig. 1**).

Figure 1: Schematic presentation of the sampling procedure of patient with SMIs attending psychiatric outpatient at ACSH, Mekelle, Ethiopia, 2020(N=423)

Data collection procedures

Demographic variables and other variables were collected using structured and semi-structured questionnaires.

WHODAS-2.0 was used to collect data regarding functional disability among SMIs.

It consists of 36 items, with six major life domains of functioning:- cognition (understanding and communication), mobility (ability to move and get around), Self-care (ability to attend to personal hygiene, dressing, and eating, and to live alone), getting along (ability to interact with other people), life activities (ability to carry out responsibilities at home, work and school) and participation with society (ability to engage in the community, civil and recreational activities) (41).

WHODAS 2.0 is a cross-culturally valid and standard tool that was developed by the WHO to measure the impact of health situations on functional disability.

Each item of the WHODAS 2.0 will score from 0 (no functional disability) to 4 (extreme functional disability). Social support was measured by using OSS-3 scale with scores from 3-14 , 3-8 = poor support; 9-11 = moderate support, and 12-14 = strong support(42). Medication non-adherence was measured by 8-item Morisky medication adherence screening tool those who score: 0-good adherence, 1-2-moderate adherence and three or more-poor adherence (43). The data were collected by two psychiatry nurses. The questioner was translated from Tigrigna language to English by experts and back-translated to Tigrigna to check the consistency of the questioner.

Variables

Dependent variable

Functional disability

Independent Variables

Socio-demographic characteristics; Behavioral factors; Psycho-social factors, and Clinical factors

Operational definitions

Functional disability: WHODAS 2.0 scoring method with the adjusted score from 0 to 100. The dichotomized score as those who score 0-4=no functional disability and those who score 5 and above = has a functional disability. The level of disability: score 0-4= no disability, 5-24= mild functional disability,

25-49= moderate functional disability, 50 - 95= severe and 96 -100= extremely severe disability/ cannot do.

Severe mental illness: includes schizophrenia, major depressive disorder, and bipolar disorder by DSM-V

Social support: according to Oslo social support scale (OSS-3) with scores from 3-14: those score 3-8 = poor support; 9-11 = moderate support; and 12-14 = strong support

Substance use: Ever use (Lifetime use): use of specific substance once in their lifetime (for now – medical purpose). Current use: Using substances of a specified type in the last 3 months (for non-medical purpose)

Medication non-adherence: those who score 0 = good adherence, 1-2= moderate adherence and 3 or more= poor adherence according to 8 items Morisky medication adherence screening tool.

Drug adverse effects: simply by asking whether they experience any drug side effects and by physical observation.

Data Quality Assurance

A pre-test was done among 5% (21 participants) of the total participants which comprised MDD, Schizophrenia & BPD patients a week before the actual data collection time to check for the understandability and reliability of the questionnaires. Two days of training on the questionnaire and ethical issues were given for the supervisor and data collectors. Daily, each collected data were checked for completeness and inconsistency. Collected data with possible errors were returned to data collectors for correction.

Data analysis procedures

The coded data were entered, checked, and cleaned with Epi data 3.1 and analyzed using Statistical Package for the Social Sciences (SPSS) version 20. Descriptive summary using frequencies, percentage and graphs were used to present study results. Bivariate analysis was done for COR and multivariable analysis was employed to calculate AOR. The strength of the association was presented by the odds ratio with a 95% confidence interval (CI). P-value < 0.05 was considered statistically significant in our study.

Results

Socio-demographic characteristics

A total of 411 participants were included in this study making 97.2% response rates. Of those, 88 were MDD, 273 schizophrenics, and 50 bipolar disorder patients.

Among the study participants, 256 (62.3%) were male, 227 (55.2%) Orthodox Christian, 263 (64%) single, 192 (46.7 %) attended secondary school, and 368 (89.5%) are living with family or close relatives. The

mean age of the participants was 35.61($\pm$ SD =10.93) years (Table 1).

Table 1: Socio demographic and economic characteristics of people with severe mental illness, at psychiatric outpatients of Mekelle, Ethiopia, 2020 (N=411).

Variables		Frequency (%)
Age	18-24	57(13.9)
	25-34	149(36.3)
	35-44	127(30.9)
	45-54	45(10.9)
	55 and above	33(8.0)
Sex	Male	256(62.3)
	Female	155(37.7)
Religion	Orthodox	227(55.2)
	Muslim	114(27.7)
	Protestant	63(15.3)
	Catholic and others	7(1.8)
Marital status	Single	263(64.0)
	Married	90(21.9)
	Divorced	50(12.2)
	Widowed	8(1.9)
Educational status	Uneducated	31(7.5)
	Primary educ.	119(29.0)
	Secondary educ.	192(46.7)
	Diploma	46(11.2)
	Degree and above	23(5.6)
Job	Has job	212(51.6)
	Jobless	199(48.4)
Living circumstance	With family	368(89.5)
	Alone	43(10.5)
Residence	Urban	357(86.9)
	Rural	54(13.1)

Clinical characteristics of the study participants

Regarding clinical variables, 164 (34.9 %) of the participants’ has duration of illness between 5- 10 years, 248 (60.3 %) were treated for 6 years and above, 192 (48.7 %) were never hospitalized, 71 (17.3%) were having co-morbid medical, and 355 (86.4 %) of the respondents had poor medication adherence **(Table 2)**.

Table 2: Description of clinical variables of people with SMIs attending psychiatric outpatient of ACSH, Mekelle, Ethiopia, 2020 (N=411)

Clinical variables	Frequency (%)
Types of diagnosis	
MDD	88 (21.4)
Schizophrenia	273(66.4)
Bipolar	50(12.2)
Duration of illness	
1-4 years	113(27.5)
5-10 years	134(32.6)
≥ 11 years	164(34.9)
Duration of treatment	
≤ 2 years	85(20.7)
3-5 years	78(19.0)
≥ 6 years	248(60.3)
No_ of hospitalization	
Never	192(48.7)
Once	111(27.0)
Two or more times	108(26.3)
Co-morbid diagnosed medical illness	
Present	71(17.3)
No	340(82.7)
Medication adherence	
Good	3(0.7)
Moderate	53(12.9)
Poor	355(86.4)
Drug side effects	
Yes	182(44.3)
No	229(55.7)

Psycho-social characteristics

Of the participants, 223 (54.3%) had moderate social support, 125 (30.4%) reported that they undermined their ability to function and having low self-esteem in every life activities, 151 (36.7%) reported that they experienced under-estimation by others including by their family members (**Table 3**).

Table 3: Description of psycho-social characteristics of patients with SMIs attending psychiatric outpatient in ACSH, Mekelle, Ethiopia, 2020 (N=411)

Variables		Frequency (%)
Social support	Poor	85 (20.7)
	Moderate	223 (54.3)
	Good	103 (25.1)
Under estimate once own capacity	Yes	125 (30.4)
	No	286 (69.6)
Experience of under estimation by others	Yes	151 (36.7)
	No	260(63.3)

Life time and current substance use of the study participants

Among total study participants 172(41.8%) use at least one type of substance in their life time for non-medical propose:107(26.0%) used to smoke cigarette in life time,125 (30.4%) use khat in life time, 72(17.5%) drink alcohol and 6(1.5 %) use cannabis in their life time. Regarding 'current substance use' status, 119 (29%) of the study participants were currently use at least one type of substances for non-medical proposes (**Table 4**).

Table 4: Life time and current substance use among patients with SMIs attending psychiatric outpatient at ACSH, Mekelle, Ethiopia, 2020 (N=411)

Variables		Frequency (%)
Life time use	Yes	172 (41.8)
	No	239 (58.2)
Cigarette smoking	Yes	107 (26.0)
	No	304 (74.0)
Alcohol	Yes	72 (17.5)
	No	339 (82.5)
Khat chewing	Yes	125 (30.4)
	No	286 (69.6)
Cannabis use	Yes	6 (1.5)
	No	405 (98.5)
Current use	Yes	119 (29.0)
	No	292 (71.0)
Cigarette smoking	Yes	81 (19.7)
	No	330 (80.3)
Alcohol	Yes	42 (10.2)
	No	369 (89.8)
Khat chewing	Yes	76 (18.5)
	No	335 (81.5)
Cannabis use	Yes	2 (0.5)
	No	409 (99.5)

Prevalence of Functional disability

According to WHODAS 2.0, the overall prevalence of functional disabilities in this study revealed that 88.1% with 95%CI [84.9-91.0] (Figure 2). Of the study participant, 51.3%, 27.5%, 9.3% had mild, moderate, and severe functional disability respectively. While the remaining, 11.9% of the study participants had no functional disability (Figure 3).

Figure 2: Prevalence of functional disability among patients with SMIs attending psychiatric outpatient at ACSH, Mekelle, Ethiopia, 2020(N=411)

Figure 3: Proportion of Level of functional disability of patients with SMIs attending psychiatric outpatients at ACSH, Mekelle, Ethiopia, 2020 (N=411)

Functional disability in specific diagnosis

Of the total participants with functional disabilities, 74 (84.1%) were MDD, 243 (89.0%) schizophrenic, and 45(90.0%) were bipolar disorder patients have any level of functional disabilities according to WHODAS 2.0 score **(Figure 4)**.

Figure 4: Magnitude of functional disability by a specific diagnosis of a patient with SMIs at psychiatric outpatient, ACSH, Mekelle, Ethiopia, 2020, (N=411)

Among those having functional disabilities, 4 (4.5%) MDD patients have a severe functional disability, 82(30%) schizophrenia patients have moderate functional disabilities, and 30(60%) bipolar patients have mild functional disabilities **(Table 5)**.

Table 5: Magnitude of functional disability among patients with SMIs attending psychiatric out patient at ACSH, Mekelle, Ethiopia, 2020, (n=411)

Diagnosis type	Frequency (N)	Level of Functional disability	N (%)
MDD	88	No Functional disability	14(15.9)
		Mild	50(56.8)
		Moderate	20(22.7)
		Severe	4(4.5)
Schizophrenia	273	No Functional disability	30(11.0)
		Mild	131(48.0)
		Moderate	82(30.0)
		Severe	30(11.0)
Bipolar	50	No Functional disability	5(10.0)
		Mild	30(60.0)
		Moderate	11(22.0)
		Severe	4(8.0)

In overall WHODAS 2.0 score, schizophrenics patients had more functional deterioration with the mean score 24.3 (± 18.1) followed by MDD patients 19.0(± 15), and bipolar disorder patients 19.3(± 16.3) (**table 6**).

Table 6: Participants' mean scores of WHODAS 2.0 domain specific and overall mean score in relation to diagnosis type of people with SMIs psychiatric outpatient at ACSH, 2020 (n=411)

WHODAS 2.0 domains	Diagnosis type		
	MDD	Schizophrenia	Bipolar
	Mean($\pm$ SD)	Mean($\pm$ SD)	Mean($\pm$ SD)
Cognition	26.4($\pm$ 25.6)	27.0($\pm$ 24.7)	25.7($\pm$ 21.1)
Mobility	10.5($\pm$ 14.5)	9.5($\pm$ 17.0)	6.7($\pm$ 19.0)
Self-care	10.3($\pm$ 8.5)	9.2($\pm$ 15.7)	7.1($\pm$ 14.4)
Getting along with people	22.3($\pm$ 22.7)	26.6($\pm$ 26.2)	19.1($\pm$ 21.3)
Life activities at home and work place	16.9($\pm$ 21.2)	26.6($\pm$ 32.4)	20.6($\pm$ 27.8)
Participation in the society	32.8($\pm$ 22.9)	44.4($\pm$ 21.8)	36.9($\pm$ 19.8)
Overall WHODAS 2.0 score	19.9($\pm$ 15)	24.3($\pm$ 18.1)	19.3($\pm$ 16.3)

N.B: higher mean value ($\pm$ SD) indicate higher functional disability

Bivariate and multivariable Analysis

Bivariate analysis

On bivariate logistic regression analysis, marital status, job status, co-morbid medical illness, number of hospitalization, duration of illness, medication adherence, drug adverse effect, relative wealth, current cigarette smoking, current alcohol use, social support, and experienced underestimation by others were significantly associated with a functional disability with a p-value of <0.2 . Therefore; variables with a p-value of <0.2 were entered into a multivariable logistic regression to control the effect of confounders.

Multivariable Analysis

On the multivariable logistic regression analysis, being jobless, illness for eleven or more years, medication non-adherent, having drug side effects, and having poor or moderate social support were found to be significantly associated with functional disability.

This study shows that patients who were jobless had 4.01 times more likely functional disability than patients who had secured jobs [AOR=4.01, 95% CI ;(1.77, 12.35)].

Those who had a duration of illness of ≥ 11 years were about 2.99 times more likely to have a functional disability than patients with duration of illness of 1-4 years [AOR=2.99, 95 % CI;(1.17,7.64)].

Regarding medication adherence, those who had poor medication adherence had about 2.79 times more likely to have a functional disability than those who were moderately and good medication adherence [AOR= 2.79, 95 % CI (1.06, 7.35)].

Respondents who experienced drug adverse effects had 4.61 times more likely to have a functional disability than those without adverse effects [AOR= 4.61, 95 % CI (1.79, 11.84)].

Study participants having poor social supports had 6.58 times more likely to have a functional disability than those with good social supports [AOR=6.58, 95 % CI (2.01, 21.56)] and moderate social supports had 4.16 times more likely to have a functional disability than those with good social supports [AOR=4.16, 95 % CI (1.88, 9.20)] (**table 7**).

Table 7: Multiple logistic regression analysis of prevalence of functional disabilities of patient with SMIs at psychiatric outpatient of ACSH, Mekelle, Ethiopia, 2020 (n=411)

Explanatory variables	Functional disability		COR(95% CI)	AOR(95% CI)
	No	Yes		
Marital status				
Single	27	236	0.82(0.30,2.24)	0.47(0.14,1.62)
Married	17	73	0.41(0.14,1.17)	0.37(0.10,1.36)
Divorced/widowed	17	53	1.00	1.00
Job status				
Jobless	7	192	6.77(2.97,15.48)	4.68(1.77,12.35)**
Has job	42	170	1.00	1.00
Relative wealth				
Less	23	297	5.38(1.75,16.59)	2.23(0.52,9.62)
Same with others	21	53	1.05(0.30,3.35)	1.14(0.26,5.07)
Better	5	12	1.00	1.00
Comorbid med. illness				
Yes	4	67	2.55(0.89,7.35)	1.88(0.49,7.14)
No	45	295	1.00	1.00
No of hospitalization				
Never hospitalized	29	163	1.00	1.00
Once	13	98	1.34(0.67,2.70)	1.02(0.44,2.38)
≥2 times	7	101	2.57(1.08,6.08)	0.78(0.26,2.42)
Duration of illness				
1-4 years	21	92	1.00	1.00
5-10 years	16	118	1.41(0.61,3.26)	2.23(0.90,5.51)
≥11 years	12	152	2.38(1.18,4.79)	2.99(1.17,7.64)*
Medication adherence				
Poor	36	319	2.68(1.32,5.45)	2.79(1.06,7.35)*
Moderate & Good	13	43	1.00	1.00
Drug side effects				
Yes	7	175	5.62(2.46,12.83)	4.61(1.79,11.84)***

No	42	187	1.00	1.00
Current cigarette smoking				
Yes	4	77	3.04(1.06,8.71)	1.83(0.54,6.23)
No	45	285	1.00	1.00
Current alcohol use				
Yes	2	40	2.92(0.68,12.48)	1.32(0.24,7.25)
No	47	322	1.00	1.00
Social support				
Poor	4	81	8.72(2.93,25.89)	6.58(2.01,21.56)**
Moderate	14	209	6.43(3.24,12.76)	4.16(1.88,9.20)***
Strong	31	72	1.00	1.00
Perceived underestimation by others				
Yes	10	141	2.49(1.20,5.14)	1.47(0.62,3.54)
No	39	221	1.00	1.00

Note: - *p-value<0.05, ** p-value <0.01, ***p-value< 0.001 1= reference

Discussion

The overall prevalence of functional disability in this study was 88.1% with 95%CI [84.9–91.0]. The finding of this study was higher than the study done in China, 69.9% of patient with SMIs had a functional disability. Although the same tool was used with our study, this difference could be due to differences in the cutoff point to dichotomize WHODAS 2 (24). The proportion of the level of functional disability was 51.3% had mild, 27.5% moderate, and 9.2% severe functional disability respectively, and none of the participants were under the level of extremely severe (complete inability to do).

Regarding the specific diagnosis of SMIs, the prevalence of functional disability was 84.1% among MDD patients, 89% of schizophrenics, and 90% of bipolar patients.

Regarding schizophrenic patients the overall functional disability showed higher magnitude than the study in China 73% of schizophrenics (70.3% mild, 1.9% moderate & 0.8% severe) (25), and Finland: 80.0% (22). The possible reason for this discrepancy might be due to the cutoff point of WHODAS 2 in china was different from ours (raw score ≤ 51 - no disability and above 51 with a disability). Differences

in sample size & study design (Cohort with N = 3,307) could be responsible for the difference in the magnitude of disability for the study in Finland.

On the other hand, the prevalence of this study regarding schizophrenics patients found to be lower than the study in Hong Kong (27) 99% (53% moderate & 46% mild) and India (18) 96.7% (70% moderate & 26% mild) functional disability. The possible reason for the difference might be a smaller sample size (N = 47 for Hong Kong & N = 30 for India) in both studies, the difference in measurement tool used (GAF score in Hong Kong & IDEAS in India).

The overall magnitude of functional disability of this study is also lower than other studies done in India (28) 100% (14.5% severe, 53.5% moderate & 32% mild) with schizophrenic patients had various levels of functional disability. The difference might be due to a smaller sample (N = 16) and different measuring tools (IDEAS).

Functional disabilities in this study among MDD patients were lower than study done in India 100% (21.5% moderate & 78.5% mild) (28), and Australia 98% (62% severe, 30% moderate & 4% mild) (23). This difference could be due to the difference in sample size (N = 8, in India), measurement tools in India, SF-12 & BDQ in Australia).

Regarding Bipolar disorder patients, the finding of functional disabilities in this study was higher than the study done in Barcelona 60% (20). The difference could be due to the difference in measurement tools (FAST in Barcelona). But in contrast to this finding the magnitude of this study was lower than the study done in India with 100% functional disabilities (23% severe, 45% moderate & 32% mild) (28). This difference might be due to the very small sample size (N = 8) which increases the magnitude and the measuring tool (IDEAS) difference.

This study shows that patients who were jobless had 4.01 times more likely functional disability than patients who had secured jobs [AOR = 4.01, 95% CI ;(1.77, 12.35)]. This study is in line with the qualitative study done in Ethiopia (35). People with SMIs have a high unemployment rate even though these people have both desire and capacity. Having occupation (job) is considered as one part of rehabilitation treatment like occupational therapy for patients with SMIs. Therefore jobless has a contribution to functional disabilities.

Those who had a duration of illness of ≥ 11 years were about 2.99 times more likely to have a functional disability than patients with duration of illness of 1–4 years [AOR = 2.99, 95% CI;(1.17,7.64)]. This study is in line with a previous study done in India (28), Nigeria (30), and Spain (20). This is due to the more the chronicity of the illness, the higher the deterioration of cognitive functioning and other skills (interpersonal, occupational skills).

Regarding medication adherence, those who had poor medication adherence had about 2.79 times more likely to have a functional disability than those who were moderately and good medication adherence [AOR = 2.79, 95% CI (1.06, 7.35)]. The finding of this study is found to be consistent in previous studies

done in Spain (20), and Egypt(31). This is because poor medication adherence has a substantial impact on disease progression, complications, relapse, and poor quality of life (44)

Respondents who experienced drug adverse effects had 4.61 times more likely to have a functional disability than those without adverse effects [AOR = 4.61, 95% CI (1.79, 11.84)]. The result of this study was harmonized with the two studies done in Ethiopia, Butajira (35), of SMIs and schizophrenics respectively.

Study participants having poor social supports had 6.58 times more likely to have a functional disability than those with good social supports [AOR = 6.58, 95% CI (2.01, 21.56)] and moderate social supports had 4.16 times more likely to have a functional disability than those with good social supports [AOR = 4.16, 95% CI (1.88, 9.20)].

This finding is in line with a study done in China (26), in Ethiopia, Butajira (35). This similarity could be because social support is a protecting factor for any mental illness.

Conclusion

The prevalence of functional disability was found to be high. Being jobless, duration of illness ≥ 11 years, medication non-adherent, having drug side effects and having poor or moderate social support were significantly associated with functional disabilities. Therefore, when treating patients with severe mental illness giving especial attention to the bio-psycho-social aspect of treatment is essential. Families of a patient with SMIs have to give support to patients. Mental health professionals have to give more attention to medication side effects while prescribing drugs, strengthening drug adherence by discussing barriers to compliance.

Limitation Of The Study

Since this study was cross-sectional it does not show the temporal relationship between the outcome variable and the independent variables. Social desirability bias (the participants may not tell their real functional status either to not be considered as impaired or expect something good if they have an exaggerated problem).

Acronyms

ACSH Ayder Comprehensive Specialized Hospital	
AOR	Adjusted Odds Ratio
CI	Confidence Interval
COR	Crude Odds Ratio

DALYS	Disability Adjusted Life Years
DSM-V	Diagnostic and statistical manual mental disorders fifth edition
FMOH	Federal Ministry of Health
FAST	Functioning Assessment Short Test
ICF	International Classification of Functioning,
IDEAS	Indian Disability Evaluation and Assessment Scale
MDD	Major Depressive Disorder
OCD	Obsessive Compulsive Disorder
QOL	Quality of Life
SIMs	Severe Mental Illnesses
WHO	World Health Organization
YLD	Year Lost with Disability

Declarations

Acknowledgments

We would like to thanks Mekelle University College of Health Science, Department of psychiatry for its provision to conduct this study. At last but not least we would like to thank Ayder comprehensive specialized hospital staffs and data collectors for their participation in his study.

Informed consent

The participants were informed about the study, and the information would keep confidential. They have the full right to draw at any time during the study period.

Author's contribution

NA and MS were the principal investigators of this study contributing conception, selecting study design, data collection as well analysis and interpretation of the data. TA participated in drafting and critically revising the manuscript. All authors agreed to be accountable for all aspects of the work. All authors read and approved the manuscript.

Funding

Mekelle University College of Health Science has funded this work.

Availabilities of data and materials

All available data and materials were included in this manuscript.

Ethical Approvals

Ethical clearance was approved by the Ethical Review Board of Mekelle University, College of Health Sciences. Written informed consent was obtained from every participant. The confidentiality of respondents was maintained. The participants have the full right to withdraw at any time during the interview process. The collected data didn't contain identifying information, and the collected data were used for this study only.

Competing of interest

The author declares that there was no conflict of interest.

References

1. Bond GR, Xie H, Drake RE. Can SSDI and SSI beneficiaries with mental illness benefit from evidence-based supported employment? *Psychiatric Services*. 2007.
2. Organization WH. International classification of functioning, disability and health: ICF: World Health Organization; 2001.
3. Anthony WA, Cohen MR, Farkas MD, Bachrach LL. *Psychiatric rehabilitation: Center for Psychiatric Rehabilitation, Boston University, Sargent College of Allied Health Professions*; 1990.
4. Prinz C, Tompson W. Sickness and disability benefit programmes: What is driving policy convergence? *International Social Security Review*. 2009;62(4):41-61.
5. Organization WH. *The World health report: 2004: Changing history*. 2004.
6. Thara R. Measurement of psychiatric disability. *Indian Journal of Medical Research*. 2005;121(6):723.
7. Organization WH. *The World Health Report 2001: Mental health: new understanding, new hope*: World Health Organization; 2001.
8. Bowie CR, Depp C, McGrath JA, Wolyniec P, Mausbach BT, Thornquist MH, et al. Prediction of real-world functional disability in chronic mental disorders: a comparison of schizophrenia and bipolar disorder.

American Journal of Psychiatry. 2010.

9.Ibrahim AW, Yahya S, Pindar SK, Wakil MA, Garkuwa A, Sale S. Prevalence and predictors of sub-optimal medication adherence among patients with severe mental illnesses in a tertiary psychiatric facility in Maiduguri, North-eastern Nigeria. *The Pan African medical journal*. 2015;21.

10.Iyer SN, Rothmann TL, Vogler JE, Spaulding WD. Evaluating outcomes of rehabilitation for severe mental illness. *Rehabilitation Psychology*. 2005;50(1):43.

11.Gureje O, Olowosegun O, Adebayo K, Stein DJ. The prevalence and profile of non-affective psychosis in the Nigerian Survey of Mental Health and Wellbeing. *World Psychiatry*. 2010;9(1):50-5.

12.Strassnig M, Signorile J, Gonzalez C, Harvey P. Physical performance and disability in schizophrenia. *Schizophrenia Research: Cognition*. 2014;1(2):112-21.

13. Raj S. Living with a disability: A perspective on disability in people living with schizophrenia (PLS). *International Journal of Psychosocial Rehabilitation* Vol 18 (1) 115. 2013;123.

14.Mathers C, Fat DM, Boerma JT. The global burden of disease: 2004 update: World Health Organization; 2008.

15.Murray CJ, Lopez AD. Global mortality, disability, and the contribution of risk factors: Global Burden of Disease Study. *The Lancet*. 1997;349(9063):1436-42.

16.Mathers CD, Stein C, Ma Fat D, Rao C, Inoue M, Tomijima N, et al. Global Burden of Disease 2000: Version 2 methods and results. Geneva: World Health Organization. 2002.

17.Malhi G, Adams D, Lampe L, Paton M, O'Connor N, Newton L, et al. Clinical practice recommendations for bipolar disorder. *Acta Psychiatrica Scandinavica*. 2009;119(s439):27-46.

18.Mohan I, Tandon R, Kalra H, Trivedi J. Disability assessment in mental illnesses using Indian disability evaluation assessment scale (IDEAS). *Indian Journal of Medical Research*. 2005;121(6):759.

19.Murray CJ, Lopez AD. Global burden of disease: Harvard University Press Cambridge, MA; 1996.

20.Rosa AR, Reinares M, Franco C, Comes M, Torrent C, Sánchez-Moreno J, et al. Clinical predictors of functional outcome of bipolar patients in remission. *Bipolar Disorders*. 2009;11(4):401-9.

21.Rosa A, González-Ortega I, González-Pinto A, Echeburua E, Comes M, Martínez-Àran A, et al. One-year psychosocial functioning in patients in the early vs. late stage of bipolar disorder. *Acta Psychiatrica Scandinavica*. 2012;125(4):335-41.

22.Honkonen T, Saarinen S, Salokangas RK. Deinstitutionalization and schizophrenia in Finland: II.Discharged patients and their psychosocial functioning. *Schizophrenia Bulletin*. 1999;25(3):543.

- 23.Sanderson K, Andrews G. Prevalence and severity of mental health-related disability and relationship to diagnosis. *Psychiatric Services*. 2002.
- 24.Lin J, Zeng Y. Quality of Life and Disability in Chinese People Living with Severe Mental Illness. *Journal of Psychosocial Rehabilitation and Mental Health*. 2015;2(2):125-9.
- 25.Zhang Z, Deng H, Chen Y, Li S, Zhou Q, Lai H, et al. Cross-sectional survey of the relationship of symptomatology, disability and family burden among patients with schizophrenia in Sichuan, China. *Shanghai Arch Psychiatry*. 2014;26(1):22-9.
- 26.Kujur NS, Kumar R, Verma A. Differences in levels of disability and quality of life between genders in schizophrenia remission. *Industrial psychiatry journal*. 2010;19(1):50.
- 27.Solanki R SP, Midha A, Chugh K, Swami M. . Disability and Quality of Life in Schizophrenia and Obsessive Compulsive Disorder: a Cross sectional Comparative Study *East Asian Arch Psychiatry* 2010 20:7-13.
- 28.Anupama K SK, Pavan Kumar Reddy CM. A study of disability in psychiatric patients. *AP J Psychological Medicine* 2012;Vol. (13): (1).
- 29.Rytsälä H. Functional and work disability and treatment received by patients with major depressive disorder. *Publications of the National Public Health Institute A*. 2006.
- 30.Gureje O, Bamidele R. Thirteen-year social outcome among Nigerian outpatients with schizophrenia. *Social Psychiatry and Psychiatric Epidemiology*. 1999;34(3):147-51.
- 31.Negm MG, Mahdy RS, Khashaba AAM, El-Latif RRA. Comparison of family burden, quality of life, and disability in obsessive compulsive disorder and schizophrenia in Zagazig University Hospitals. *Egyptian Journal of Psychiatry*. 2014;35(1):39.
- 32.Bakare M, Agomoh A, Eaton J, Ebigbo P, Onwukwe J. Functional status and its associated factors in Nigerian adolescents with bipolar disorder. *African journal of psychiatry*. 2011;14(5):388-91.
- 33.Bolton P, Wilk CM, Ndogoni L. Assessment of depression prevalence in rural Uganda using symptom and function criteria. *Social psychiatry and psychiatric epidemiology*. 2004;39(6):442-7.
- 34.Yalemwork G. Depression among Addis Ababa University Students Sidist Kilo Campus: Prevalence, Gender Difference and Other Associated Factors 2015.
- 35.Habtamu K, Alem A, Hanlon C. Conceptualizing and contextualizing functioning in people with severe mental disorders in rural Ethiopia: a qualitative study. *BMC psychiatry*. 2015;15(1):1.
- 36.Kebede D, Alem A, Shibre T, Negash A, Deyassa N, Beyero T, et al. Short-term symptomatic and functional outcomes of schizophrenia in Butajira, Ethiopia. *Schizophrenia research*. 2005;78(2):171-85.

- 37.Mogga S, Prince M, Alem A, Kebede D, Stewart R, Glozier N, et al. Outcome of major depression in Ethiopia Population-based study. *The British Journal of Psychiatry*. 2006;189(3):241-6.
- 38.Kebede D, Alem A, Shibire T, Deyassa N, Negash A, Beyero T, et al. Symptomatic and functional outcome of bipolar disorder in Butajira, Ethiopia. *Journal of affective disorders*. 2006;90(2):239-49.
- 39.Fekadu A. *Studies on Affective Disorders in Rural Ethiopia*. Umeå University Medical Dissertations. 2010 (1381).
- 40.Matza LS, Buchanan R, Purdon S, Brewster-Jordan J, Zhao Y, Revicki DA. Measuring changes in functional status among patients with schizophrenia: the link with cognitive impairment. *Schizophrenia Bulletin*. 2006;32(4):666-78.
- 41.Üstün TB, Chatterji S, Kostanjsek N, Rehm J, Kennedy C, Epping-Jordan J, et al. Developing the World Health Organization disability assessment schedule 2.0. *Bulletin of the World Health Organization*. 2010;88(11):815-23.
- 42.Abiola T UO, Zakari M. Psychometric Properties of the 3-Item Oslo Social Support Scale among Clinical Students of Bayero University Kano, Nigeria *MJP Online Early*. 2013.
- 43.Bond GR, Becker DR, Drake RE, Rapp CA, Meisler N, Lehman AF, et al. Implementing Supported Employment as an Evidence-Based Practice *Psychiatric Services*. 2001.
- 44.Association AP. Improving medication adherence in patients with severe mental illness; . *Pharmacy Today* 2013;19(6):69–80.

Figures

Figure 1

Schematic presentation of the sampling procedure of patient with SMIs attending psychiatric outpatient at ACSH, Mekelle, Ethiopia, 2020(N=423)

Figure 2

Prevalence of functional disability among patients with SMIs attending psychiatric outpatient at ACSH, Mekelle, Ethiopia, 2020(N=411)

Figure 3

Proportion of Level of functional disability of patients with SMI attending psychiatric outpatients at ACSH, Mekelle, Ethiopia, 2020 (N=411)

Figure 4

Magnitude of functional disability by a specific diagnosis of a patient with SMI at psychiatric outpatient, ACSH, Mekelle, Ethiopia, 2020, (N=411)