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Predictors of unrecognised comorbid depression in patients with schizophrenia at Amanuel mental specialized hospital, Ethiopia: a cross-sectional study

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ABSTRACT

Background The occurrence of depression in patients with schizophrenia (PWS) increases the risk of relapse, frequency and duration of hospitalisation, and decreases social and occupational functioning.

Objective This study aimed to assess prevalence of unrecognised comorbid depression and its determinants in PWS.

Method A cross-sectional study was conducted from 1 to 30 March 2019 at Amanuel mental specialized hospital among 300 PWS. The 9-item Calgary Depression Scale for Schizophrenia was used to assess comorbid depression. Logistic regression was used to determine the association between outcome and explanatory variables. Statistical significance was declared at p value <0.05 with 95% CI.

Results The prevalence of unrecognised comorbid depression was found to be 30.3%. Living alone (adjusted OR (AOR)=3.49, 95% CI=0.45 to 8.36), having poor (AOR=4.43, 95% CI=1.45 to 13.58) and moderate (AOR=4.45, 95% CI=1.30 to 15.22) social support, non-adherence to medication (AOR=3.82, 95% CI=1.70 to 8.55), presenting with current negative symptoms such as asocialia (AOR=4.33, 95% CI=1.98 to 9.45) and loss of personal motivation (AOR=3.46, 95% CI=1.53 to 7.84), and having suicidal behaviour (AOR=6.83, 95% CI=3.24 to 14.41) were the significant predictors of comorbid depression in PWS.

Conclusion This study revealed considerably a high prevalence of unrecognised comorbid depression among PWS. Therefore, clinicians consider timely screening and treating of comorbid depression in PWS.

Strengths and limitations of this study

- The main strength of this study is we use a standardised tool (Calgary Depression Scale for Schizophrenia (CDSS)) designed to assess depression in patients with schizophrenia (PWS).
- Exclusion of patients who were on antidepressant medications and studying only PWS in outpatients could have led to an underestimation of the prevalence of depression.
- Our study was a cross-sectional design that does not show cause and effect relationship.
- Using non-probability consecutive sampling method and small sample size also might be considered as limitation.
- Even though we use internationally validated instrument to assess depression, CDSS was not yet validated in Ethiopia.

INTRODUCTION

Both schizophrenia and depression are the most overwhelming psychiatric illnesses that have substantial contribution to the global burden of disease.[1–3] Besides, patients with schizophrenia (PWS) have an increased risk of developing depressive symptoms compared with the general population.[4] During the course of their illness, majority of PWS show depressive symptoms[5] and therefore, depressive symptoms are an important part of schizophrenia.[6]

PWS develop depressive symptoms anytime during the course of the illness that is, either in the prodrome of a new episode, concurrently with the acute episode or in the post-psychotic period.[7] However, negative symptoms in schizophrenia that are similar to those in depression such as apathy, lack of emotion or poor social functioning reflect a decrease in the level of normal functions.[8] In addition, extra-pyramidal side effects, developing in relation with antipsychotic drugs, complicate the diagnosis of depression among PWS.[9] Therefore, the occurrence of depression in PWS complicates the diagnosis and treatment process.

Co-occurrence of depression in PWS also affects the prognosis of the disease. This further increases the risk of relapse, frequency and duration of hospitalisation, and decreases social and occupational functioning.[10] The

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Table 1 Sociodemographic characteristics of patients that participate on study of predictors of unrecognised depression in PWS at AMSH, 2019

S.No	Variable	Categories	Frequency	Percentage (%)
1	Age	18–27	60	20.0
		28–37	116	38.7
		38–47	82	27.3
		≥48	42	14.0
2	Sex	Male	203	67.7
		Female	97	32.3
3	Marital status	Single	179	59.7
		Married	92	30.7
		Divorced	29	9.6
4	Religion	Muslim	99	33
		Orthodox	148	49.3
		Protestant	46	15.3
		Others	7	2.3
5	Educational status	Illiterate	70	23.4
		1–8th grade	75	25
		9–12th grade	122	40.7
		College and above	33	11
6	Occupation	Employed	62	20.7
		Unemployed	238	79.3
7	Average monthly income	≤US$18.4	201	67
		≥US$18.5	99	33
8	Place of residence	Rural	78	26
		Urban	222	74
9	Living status	With family	244	81.3
		Alone	56	18.7

AMSH, Amanuel mental specialised hospital; PWS, patients with schizophrenia.

expected lifespan of PWS could be reduced by an average of 10–15 years, and suicide is the leading cause of this premature death among PWS.[11] More than half of PWS attempts suicide and 9%–13% completed suicide in their lifetime,[11 12] which could be more complicated and severe with presence of depression. Furthermore, emerging depressive symptoms are associated with impairment in everyday functioning, poorer quality of life, substance abuse and weak response to pharmacological treatment.[13]

A review of previous studies reported that prevalence of comorbidity of depression among PWS is 7%–75%,[14] but on average, depression is observed in one out of four patients.[15 16] Depressed mood is commonly associated with first and acute psychotic episodes of PWS.[17] However, one-third of PWS reported depressive symptoms several months after the remission of a psychotic episode, recently termed 'post-psychotic depression'.[18] Studies reported that 25% of PWS developed post-psychotic depression[19] and more than 80% of patients with first episode psychosis did suffer from depressed mood.[14] Moreover, reports from longitudinal studies indicate that depressive symptoms have found to be prevalent during all stages of schizophrenia.[20]

Depressive symptoms in PWS could be associated with responses to psychological stress or deficits,[21] undesired side-effects of antipsychotics medications,[22] substance or drug abuse[23] and other organic or physical illnesses.[24] Furthermore, social isolation, loss, unemployment, financial difficulties, adverse life events and stigma are some of the factors that are associated with depression in schizophrenia.[25]

Yet, depressive symptoms that occur in PWS are often overlooked, inadequately characterised and not consistently integrated into treatment.[25] Therefore, recognising depressive symptoms or episodes in PWS may promote the pharmacological treatment of depressive episodes and thus prevent subsequent suicide attempts or suicide. Therefore, the aim of this study was to assess the magnitude of unrecognised comorbid depression and predicting factors among PWS.

The present study is among the first in our community to underscore the hypothesis that depression is an important clinical phenomenon in schizophrenia. The most striking finding of this study is that it alerts mental health professionals about the unrecognised depressive symptoms in PWS.

METHODS

Ethics statement

The Institutional Review Board of Hawassa University, College of Medicine and Health Sciences approved the study and written informed consent was received from all participants.

Study design, area and period

From 1 to 30 March 2019, an institution-based cross-sectional study was conducted at Amanuel mental specialized hospital (AMSH) in Addis Ababa, Ethiopia. The hospital is one of the oldest in Ethiopia, having been founded in 1930 E.C. during the Ethio-Italian war, and it is the country's only mental hospital. Each year, approximately 46 520 patients with psychiatric disorders visit as outpatients, and approximately 160 patients are admitted to the ward each month. The hospital has over 300 beds and serves patients with all types of mental disorders. There are 13 outpatient departments (OPDs) at the hospital. The hospital also serves as a teaching facility and a research facility for mental health sciences.

Population

All PWS who had a follow-up visit at AMSH belonged to the source population. The study population consisted

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Table 2 Clinical characteristics of PWS at AMSH, 2019

Variable		Categories	Frequency	Percentage (%)
Duration of Illness		≤12 months	24	8
		13–60 months	100	33.3
		≥61 months	176	58.7
History of known chronic illness		Yes	39	13.0
		No	260	86.7
Family history of mental illness		Yes	76	25.3
		No	224	74.7
Episodes of illness		Continuous	74	24.7
		Single episode	82	27.3
		2–4 episode	87	29
		5 and above	57	19
Any substance use in the past 12 months		Yes	84	28.0
		No	216	72.0
Medication adherence		Adhered	232	77.3
		Non-adhered	68	22.7
Social support		Poor	161	53.7
		Moderate	99	33.0
		Strong	40	13.3
Positive symptoms of schizophrenia	Delusional symptoms	Yes	90	30
		No	210	70
	Hallucinatory symptoms	Yes	99	33
		No	201	67
	Disorganised speech or behaviour	Yes	26	8.7
		No	273	91
Negative symptoms of schizophrenia	Anhedonia	Yes	102	34
		No	197	65.7
	Asocialia	Yes	84	28
		No	216	72
	Loose of personal motivation	Yes	67	22.3
		No	232	77.3
	Loose of verbal expression	Yes	35	11.7
		No	264	88
Suicide behaviour		Yes	91	30.3
		No	209	69.7

AMSH, Amanuel mental specialized hospital; PWS, patients with schizophrenia.

of all sampled PWS who had a follow-up visit at AMSH during the study period and met the inclusion criteria.

Inclusion and exclusion criteria

PWS who were 18 years or older were included in the study. PWS who were experiencing severe acute psychotic episodes and were unable to communicate were, however, excluded from the study. Clinical Global Impression Severity (CGI-S) Scale with seven-point scale was used to assess the severity of the psychotic episode. The CGI-S scale ranges from 1 (normal) to 7 (among the most seriously ill).[26] Patients with a CGI-S score of 6 or higher were excluded from the study. Patients who were on antidepressant medication were also excluded.

Sample size determination and sampling technique

Using the consecutive sampling technique, 300 PWS were chosen from the AMSH OPD. PWS who visited psychiatry OPD during the study period and met the inclusion

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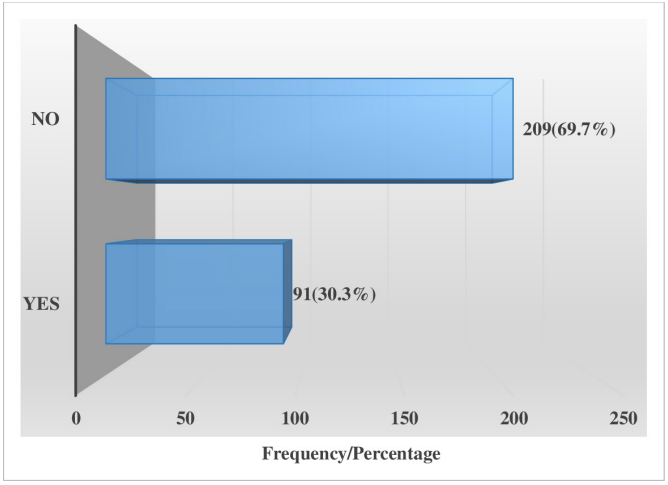

Figure 1 Comorbid depression in PWS at AMSH Addis Ababa, Ethiopia, 2019. AMSH, Amanuel mental specialized hospital; PWS, patients with schizophrenia.

criteria were enrolled until the final study sample size was reached.

Data collection tools and quality assurance

A structured questionnaire administered by an interviewer was used to collect data. The questionnaire is divided into six sections: part one includes questions about patients' sociodemographic characteristics and related factors; part two includes questions about patient clinical characteristics; part three is about patient social support; part four is about medication adherence; part five is about patients' suicidal behaviour and part six is about depression screening. Psychiatrists, psychiatry residents and senior or expert mental health professionals made patient diagnoses based on Diagnostic Statistical Manual for Mental Disorders-5 diagnostic criteria.

The Calgary Depression Scale for Schizophrenia (CDSS) was used to assess the change in the level and intensity of unrecognised depressive symptoms in schizophrenia. It consists of nine items scored on a Likert scale (0=absent, 1=mild, 2=moderate and 3=severe). The lowest possible score is 0 and the highest possible score is 27.[27] A CDSS score of more than 6 points has been proposed to distinguish PWS with depression from those who do not.[28]

The level of social support among PWS was measured using the three-item Oslo Social Support Scale, with scores ranging from 3 to 14.[29] To assess medication adherence in PWS, a four-item questionnaire adapted from a previous study was used. The four items have a scoring scheme of 'Yes'=0 and 'No'=1. The items are added up to give a score from 0 to 4, with 1 being adhered and 2 being non-adhered.[30]

To evaluate suicidal behaviour the Suicidal Behaviour Questionnaire Revised (SBQ-R) with four items was used. SBQ-R item 1 assesses lifetime suicidal ideation and attempt; item 2 evaluates the frequency of suicidal ideation over the previous 12 months; item 3 assesses the threat of suicidal behaviour and item 4 assesses self-reported likelihood of suicidal behaviour. With a score of 3–18 and a cut-off point of 8, the sensitivity was 80% and the specificity was 91% for the adult clinical population.[31]

To ensure the tool's consistency and understandability, an independent person translated the English version questionnaire into Amharic and then back into English. Language experts were brought in to help with the translation of the questionnaire. The information was gathered by psychiatry nurses who were overseen by expert mental health professionals. Data collectors and supervisors were both given training. Before the main study, a pre-test on 5% of the study sample size was conducted at AMSH among PWS in the psychiatric ward to identify potential problems with data collection instruments, as well as to check the consistency of the questionnaires and the performance of the data collectors. Aside from that, the data collectors were supervised daily, and the completed questionnaires were checked daily by the supervisors and principal investigator.

Data processing and analysis

Before beginning analysis, the collected data were checked, coded and entered into Epi-data V.3.1 to minimise errors during data entry; the data were then exported to SPSS V.20 for cleaning and analysis. The sociodemographic and clinical characteristics of the patients were analysed using descriptive statistics, that is, frequencies and percentages were calculated for categorical variables. For each independent variable, an independent bivariate logistic regression analysis was performed against the dependent variable or CDSS. Variables with a p value of <0.05 were considered as candidates for multiple logistic regression to determine the variables that independently predict depression in simple binary logistic regression analysis. The multivariate analysis results were presented as crude and adjusted ORs. In multivariate logistic regression analysis, a p value of <0.05 was declared statistically significant at the 95% CI. Finally, the study's findings were summarised using tables, graphs and narrative descriptions.

Patients and public involvement

Patients and the public were not involved in this study, including the recruitment, data collection, analysis, interpretation and dissemination of the results.

RESULTS

Sociodemographic and clinical characteristic of participants

The study included 300 PWS. More than two-thirds (203, 67.7%) of the participants were men, and 116 (38.7%) participants were between the age of 28 and 37 years. The majority of the participants (179 (59.7%)) were single, 238 (79.3%) of the study participants were unemployed and 257 (85.7%) were living with their family (table 1).

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Table 3 Bivariate analyses of risk factors for unrecognised depression in PWS at AMSH, 2019

Variables	Category	Depression		COR	P value
		No	Yes	OR (95% CI)	
Age	18–27	39 (74.6%)	21 (25.6%)	1	
	28–37	87 (75.0%)	29 (25.0%)	0.619 (0.315 to 1.218)	0.165
	38–47	58 (70.4%)	24 (29.6%)	0.768 (0.377 to 1.567)	0.469
	≥48	25 (59.5%)	17 (40.5%)	1.263 (0.560 to 2.847)	0.574
Sex	Male	135 (66.5%)	68 (33.5%)	1	
	Female	74 (33.3%)	23 (26.7%)	0.617 (0.356 to 1.071)	0.086
Marital status	Single	127 (71.0%)	52 (29.0%)	1	
	Married	63 (68.4%)	29 (31.6%)	1.124 (0.652 to 1.940)	0.674
	Divorced	19 (65.5%)	10 (34.5%)	1.285 (0.560 to 2.951)	0.554
Educational status	Illiterate	52 (74.2%)	18 (25.8%)	0.368 (0.154 to 0.876)	0.024
	Primary	52 (69.3%)	23 (30.7%)	0.470 (0.203 to 1.089)	0.078
	Secondary	88 (72.1%)	34 (27.9%)	0.411 (0.186 to 0.904)	0.027
	≥College	17 (51.5%)	16 (48.5%)	1	
Occupational status	Employed	39 (62.9%)	23 (37.1%)	1	
	Unemployed	170 (71.2%)	68 (28.8%)	0.678 (0.377 to 1.220)	0.195
Area of residence	Rural	51 (65.3%)	27 (34.7%)	1	
	Urban	158((71.1%)	64 (28.9%)	0.765 (0.442 to 1.325)	0.340
Living status	With family	186 (72.3%)	58 (23.7 %)	1	
	Alone	23 (41.1%)	33 (58.9%)	4.601 (2.504 to 8.456)	<0.001
Duration of illness	≤12 months	15 (62.5%)	9 (37.5%)	1	
	13–60 months	76 (76.0%)	24 (24.0%)	0.526 (0.205 to 1.354)	0.183
	≥61 months	118 (67.0%)	58 (33.0%)	0.819 (0.338 to 1.983)	0.658
Known chronic illness	Yes	18 (46.1%)	21 (53.9%)	3.183 (1.602 to 6.325)	0.001
	No	191 (73.1%)	70 (26.9%)	1	
Family history of mental Illness	Yes	50 (65.7%)	26 (34.3%)	1.272 (0.730 to 2.215)	0.395
	No	159 (70.9%)	65 (29.1%)	1	
Episodes of illness	Continuous	53 (71.6%)	21 (28.4%)	1	
	Single episode	60 (73.1%)	22 (28.9%)	0.925 (0.458 to 1.869)	0.829
	2–4 episode	57 (65.5%)	30 (34.5%)	1.328 (0.679 to 2.600)	0.407
	5 and above	39 (68.4%)	18 (31.6%)	1.165 (0.548 to 2.474)	0.691
Substance use	Yes	55 (65.4%)	29 (34.5%)	1.310 (0.765 to 2.242)	0.325
	No	154 (71.2%)	62 (28.8%)	1	
Social support	Poor	101 (62.7%)	60 (37.3%)	2.801 (1.166 to 6.724)	0.021
	Moderate	75 (75.8%)	24 (24.2%)	1.509 (0.592 to 3.847)	0.389
	Strong	33 (82.5%)	7 (17.5%)	1	
Medication adherence	Adhered	175 (75.4%)	57 (24.6%)	1	
	Non-adhered	34 (50.0%)	34 (50.0%)	3.070 (1.751 to 5.383)	<0.001
Hallucination	Yes	58 (58.5%)	41 (41.5%)	2.135 (1.279 to 3.562)	0.004
	No	151 (75.1%)	50 (24.9%)	1	
Delusion	Yes	49 (54.4%)	41 (45.6%)	2.678 (1.588 to 4.515)	<0.001
	No	160 (76.1%)	50 (23.9%)	1	
Disorganised speech	Yes	9 (33.3%)	18 (66.7%)	5.479 (2.356 to 12.741)	<0.001
	No	200 (73.2%)	73 (26.8%)	1	

Continued

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Table 3 Continued

Variables	Category	Depression		COR	P value
		No	Yes	OR (95% CI)	
Anhedonia	Yes	55 (53.3%)	48 (46.7%)	3.126 (1.869 to 5.226)	<0.001
	No	154 (78.1%)	43 (21.9%)	1	
Asocialia	Yes	38 (45.2%)	46 (54.8%)	4.600 (2.679 to 7.900)	<0.001
	No	171 (79.1%)	45 (20.9%)	1	
Loss of personal motivation	Yes	27 (39.7%)	41 (60.3%)	5.527 (3.101 to 9.851)	<0.001
	No	182 (78.4%)	50 (21.6%)	1	
Alogia	Yes	18 (50.0%)	18 (50.0%)	2.616 (1.290 to 5.305)	0.008
	No	191 (72.3%)	73 (27.7%)		
Suicide behaviour	Yes	38 (41.7%)	53 (58.3%)	0.159 (0.092 to 0.275)	<0.001
	No	171 (81.8%)	38 (18.2%)	1	

AMSH, Amanuel mental specialized hospital; COR, crude OR; PWS, patients with schizophrenia.

Clinical characteristic of study participants

Majority of all participants (176 (58.7%)) have had their illness for more than 5 years, and 84 (28%) have used at least one type of substance in the previous 12 months. Among the most common symptoms hallucination and anhedonia, which affect one-third of the participants 99 (33%) and 102 (34%), respectively. Approximately half of the study participants (161 (53.7%)) had a poor social support, and 91 (30.3%) had suicide behaviour (table 2).

Magnitude of comorbid depression among patients with schizophrenia

Among 300 PWS, 91 (30.3%) have unrecognised comorbid depression according to CDSS (figure 1).

Independent predictors of unrecognised depression

Educational status, living status, known history of chronic medical illness, level of social support, medication adherence, positive symptoms (hallucination, delusion and disorganised speech), negative symptoms (anhedonia, asocialia, loss of personal motivation and alogia) and suicide behaviour are among the many variables that run in bivariate logistic regression analyses and become candidates for multiple logistic regression analysis at p value <0.05 (table 3).

Finally, in multivariate logistic regression model, living alone (AOR=3.488, 95% CI=0.455 to 8.363), having poor (AOR=4.434, 95% CI=1.448 to 13.581) and moderate (AOR=4.447, 95% CI=1.299 to 15.221) social support, non-adherence to medication (AOR=3.815, 95% CI=1.702 to 8.551), presenting with current negative symptoms such as asocialia (AOR=4.327, 95% CI=1.980 to 9.455) and loss of personal motivation (AOR=3.462, 95% CI=1.528 to 7.844), and having suicidal behaviour (AOR=6.834, 95% CI=3.240 to 14.411) were the significant predictors of unrecognised comorbid depression among PWS as shown in table 4.

DISCUSSION

The primary aim of this study was to determine the prevalence of unrecognised comorbid depression among PWS. This study found out that nearly one-third of PWS (30.3%) has undiagnosed depression in a stable phase of the disease. This is in agreement with previous studies 30% in Egypt,[32] 27.2% in Greece[33] and 31% in Spain.[34] Similarly, a study among PWS living in a nursing home found out that more than one-fourth (26.5%) were present with depression.[27] However, higher prevalence (56%) of depression was reported by Cardoso and his colleagues based on the CDSS among PWS.[35] In addition, the prevalence of comorbid depressive symptoms was reported to be 40.6%–54.6%[36–38] in patients with Chinese chronic schizophrenia which is higher than our finding. This inconsistency might be explained by the fact that previous studies may have included some patients in the acute phase because the higher rate of depression is reported in the prodromal and acute phases compared with the stable phase of schizophrenia.[39] Similarly, in this study, patients treated with antidepressants were excluding from the study too.

With respect to our overall theoretical model, we found that 13 categories of variables were significant in bivariate analysis and that only seven retained statistically significance in multiple logistic regression analysis. Patients who were living alone, having poor and moderate social support, non-adherence to medication presenting with current negative symptoms like asocialia and loss of personal motivation and having suicidal behaviour were identified as a number of variables that were associated with higher rates of unrecognised comorbid depression in people with schizophrenia.

Our study found out that depression rate of PWS who were living alone and had poor or moderate social support was quite higher as compared with their counterparts. This indicates that lack of family support and environmental conditions like having inadequate social support

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Table 4 Predictors of unrecognised depression on multivariate logistic regression analyses in PWS at AMSH, 2019

Variables	Category	Depression		AOR	95% CI		P value
		No	Yes		Lower	Upper	
Marital status	Single	127 (71.0%)	52 (29.0%)	1			
	Married	63 (68.4%)	29 (31.6%)	1.188	0.543	2.601	0.666
	Divorced	19 (65.5%)	10 (34.5%)	0.716	0.194	2.642	0.617
Educational status	Illiterate	52 (74.2%)	18 (25.8%)	0.216	0.066	0.709	0.061
	Primary	52 (69.3%)	23 (30.7%)	0.371	0.118	1.165	0.089
	Secondary	88 (72.1%)	34 (27.9%)	0.378	0.127	1.122	0.080
	≥College	17 (51.5%)	16 (48.5%)	1			
Living status	With family	186 (72.3%)	58 (23.7 %)	1			
	Alone	23 (41.1%)	33 (58.9%)	3.488	1.455	8.363	0.005
Known chronic illness	Yes	18 (46.1%)	21 (53.9%)	1.980	0.731	5.360	0.179
	No	191 (73.1%)	70 (26.9%)	1			
Social support	Poor	101 (62.7%)	60 (37.3%)	4.434	1.448	13.581	0.009
	Moderate	75 (75.8%)	24 (24.2%)	4.447	1.299	15.221	0.017
	Strong	33 (82.5%)	7 (17.5%)	1			
Medication adherence	Adhered	175 (75.4%)	57 (24.6%)	1			
	Non-adhered	34 (50.0%)	34 (50.0%)	3.815	1.702	8.551	0.001
Hallucination	Yes	58 (58.5%)	41 (41.5%)	0.981	0.471	2.044	0.959
	No	151 (75.1%)	50 (24.9%)	1			
Delusion	Yes	49 (54.4%)	41 (45.6%)	1.387	0.668	2.879	0.380
	No	160 (76.1%)	50 (23.9%)	1			
Disorganised speech	Yes	9 (33.3%)	18 (66.7%)	1.778	0.584	5.411	0.311
	No	200 (73.2%)	73 (26.8%)	1			
Anhedonia	Yes	55 (53.3%)	48 (46.7%)	1.953	0.914	4.173	0.084
	No	154 (78.1%)	43 (21.9%)	1			
Asocialia	Yes	38 (45.2%)	46 (54.8%)	4.327	1.980	9.455	<0.001
	No	171 (79.1%)	45 (20.9%)	1			
Loss of personal motivation	Yes	27 (39.7%)	41 (60.3%)	3.462	1.528	7.844	0.003
	No	182 (78.4%)	50 (21.6%)	1			
Alogia	Yes	18 (50.0%)	18 (50.0%)	0.822	0.307	2.202	0.697
	No	191 (72.3%)	73 (27.7%)	1			
Suicide	Yes	38 (41.7%)	53 (58.3%)	6.834	3.240	14.411	<0.001
	No	171 (81.8%)	38 (18.2%)	1			

AMSH, Amanuel mental specialized hospital; AOR, adjusted OR; PWS, patients with schizophrenia.

could be important factors in the exhibition of depressive symptoms in PWS.[27] In addition, social support is postulated to safeguard mental health through the benefits of social relationships and as a buffer against stressful conditions.[40] Therefore, support from a spouse, relatives or friends is supposed to have independent protective effects against depression.[41 42]

Our results, consistent with the literature, found an association between having chronic physical illnesses and depression.[43] In our study, patients with any type of chronic illnesses like diabetes, HIV/AIDS, cancer, hypertension and so on have two times more likely to have depression than those without chronic illnesses. Moreover, the interplay among physical illness and depression in PWS is probably bidirectional.[44] Living with depression and a chronic physical illness can make life more complicated. It can make living harder to find the energy to work, exercise, interact with family members and friends or take medication regularly.[45] This could make you feel isolated and make it firmer to get better from depression easily.

This study showed that people with schizophrenia who are non-adherent to their anti-psychotic medication were nearly four times at higher risk to develop depression. It

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is fact that patients who are adherent well to their treatment had decreased symptomatology and become functional socially and occupationally. This reduces stigma, increases self-esteem, and inspires hope in PWS, which indirectly reduces the risk of depression. Studies reported that depression could occur in antipsychotic-free PWS and the magnitude of significant depression decreases when antipsychotic treatment is started.[46] In fact, several studies found out that antipsychotic medications do not seem to induce depressive syndromes in PWS.[47] On the other hand, other reports tend to underline that neuroleptic medications are responsible for the development of depressive episodes in PWS.[48]

In our study, patients with negative symptoms that is, those who had asocialia and loss of personal motivation were more than four and three times greater risk of developing depression, respectively. This could be due to the fact that the conceptual overlap between depressive syndromes and negative symptoms.[49] Furthermore, antipsychotic medications could have aetiological role in depressive symptomatology in schizophrenia associated with its action on dopaminergic pathways (play major role in reward and pleasure) and extra pyramidal side-effect that causes 'akinetic depression'.[39] There is no clear boundary between the two syndromes. However, it is fact that the presentations of the symptoms are different qualitatively and subjectively in the context of depression and negative symptoms.

Those PWS having suicidal behaviour were nearly seven times more likely to have depressive features. Similar to our finding, Gokhan *et al*[50] found statistically significant higher CDSS average score in patients with suicidal ideations and wishes as compared with their counterparts. Nearly 10% of people with schizophrenia commit suicide, and most of them had history of depressive episodes or had presented with signs or symptoms of depression during their contacts with health workers.[39]

Even though, this study provided a baseline data, and we use a standardised tool (CDSS) designed to assess depression in PWS, it also has some limitations encountered. Exclusion of patients who were on antidepressant medications and studying only PWS in outpatients could have led to an underestimation of the prevalence of depression. Our study was a cross-sectional design that does not show cause and effect relationship also might be considered as limitation. It might be difficult to generalise the findings of this study due to the reason that this study was conducted using non-probability consecutive sampling method and small sample size. In addition, even though, we use internationally validated instrument to assess depression, CDSS was not yet validated in Ethiopia.

CONCLUSION AND RECOMMENDATIONS

Nearly one-third of PWS have undiagnosed depression in a stable phase of the disease. Therefore, the prevalence of unrecognised depression in this study was found to be 30.3%. The likelihood of having unrecognised comorbid depression was higher among those living alone, and those having poor and moderate social support. Furthermore, non-adherence to medication, presenting with negative symptoms like asocialia and loss of personal motivation, and having suicidal behaviour were significantly associated with comorbid depression.

Therefore, we recommend clinicians better to strengthen early screening of comorbid depression among PWS and take early appropriate treatment measures in order to prevent or lessen the burden of depression on the treatment outcome of schizophrenia. Our key recommendation to psychiatrists and mental health professionals who treat PWS and depression is to perform a careful diagnostic assessment, which is essential to tailor appropriate treatments. From our results, we have firm grounds that those clinicians to initiate suitable psychosocial interventions and medications for PWS.

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