

Research Article

Quality of Life in Patients Suffering from Bipolar Disorder

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ABSTRACT:

Background: Patients with Bipolar Disorder (BD) suffer from poor quality of life (QOL) and impaired psychosocial functioning. Research indicates that the lowest quality of life scores were recorded during the depressed state followed by manic/hypomanic states while there was least impairment of quality of life in euthymic states.

Objective: This study aims to determine the quality of life in individuals suffering from bipolar disorder.

Methodology: The PRISMA Checklist 2020 was used as a protocol to conduct this systematic review. Databases such as PubMed, Cochrane, ClinicalTrail.gov, CINAHL, Embase, Science-direct and Google scholar were searched for the articles published between 2013 to 2023 using the keywords. The articles were uploaded on Mendley and duplicates were removed. The remaining articles were screened on the basis of title and abstract and then sought for retrieval. The retrieved articles were assessed for further eligibility. Following the application of inclusion and exclusion criteria, the final articles were obtained to be included in our systematic review for data extraction.

Results: There is poor QOL in BD patients compared with general population. Psychological and physical domain of QOL are affected the most in BD. There is also a significant impact upon social domain and levels of independence. However, environmental and spiritual domains of QOL are least effected.

Conclusions: In the past few years, major achievements in the pharmacological control of BD patients have been done, thus diverting our attention to increasing the quality of life of BD patients. Our systematic review chiefly gives information about how BD negatively affects QOL in all domains of life. In recent years bipolar disorder has become an important health concern not only for individuals with BD but also for our society, thus more studies evaluating QOL in bipolar disorder should be further conducted.

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Key Words: Quality of life, Bipolar Disorder, Mania, Hypomania.

INTRODUCTION:

Bipolar disorder (BD) is a mental illness that causes unusual shifts in a person's mood, energy and activity levels, BD patients experience mood episodes that can be manic/ hypomanic, depressive and neutral¹. Spectrum of BD includes bipolar I disorder (with a prerequisite of at least one manic episode during a lifetime), bipolar II disorder (demanding a lifetime of major depressive and hypomanic episodes, with no history of mania) and BD not otherwise specified². Research indicates that brain is affected by each bipolar disorder mood episodes that disrupts the homeostasis between inflammatory mechanisms, oxidative processes and neuroprotective mechanisms leading to neuronal death and progression of bipolar disorder³. Bipolar disorders are the major cause of disability all over the world⁴. The worldwide prevalence of BD is around 1%⁵. Research has indicated that 25 to 50% of patients with BD will try to attempt suicide once in their life while 15% to 19% will commit suicide⁶. The onset of BD is irrespective of ethnicity, nationality and socioeconomic status⁷. Research has highlighted that BD patients are at an increased risk of physical health problems which includes hypertension, diabetes, cardiovascular disease and weight gain⁸. Bipolar disorder is also commonly associated with psychiatric co-morbidities like anxiety disorders (31.8%), eating disorders (33%), drug abuse (33.5%), alcohol abuse (18.3%), attention deficit hyperactivity disorder (25%), obsessive compulsive disorder (21%) and post-traumatic stress disorder (4 to 40%)⁹. Previous studies have shown that patients with BD suffer from poor quality of life and impaired psy-

chosocial functioning¹⁰. The World Health Organization defines Quality of life (QOL) as "Individual's perception of his/ her position in routine life in the context of system of principles and culture as well as in relation with common standards and personal goals"¹¹. Depressive symptomatology causes significant psychosocial impairment which in turn negatively affects QOL¹². Research indicates that the lowest quality of life scores were recorded during the depressed state followed by manic/ hypomanic states while there was least impairment of quality of life in euthymic states¹³. This study aims to determine the quality of life in individuals suffering from bipolar disorder. Although many studies related to QOL in BD have been conducted in past years, this systematic review however, will elucidate the impact of BD on various different domains of QOL. This will enable the healthcare professionals to have a better understanding of quality of life and thus, take measures which can improve the lifestyle of BD patients. It will also provide insight into strategies to potentially lessen the burden of illness for healthcare system.

MATERIALS AND METHODS:

The PRISMA Checklist 2020 was used as a protocol to conduct this systematic review. Databases such as PubMed, Cochrane, Clinical Trail. gov, CINAHL, Embase, Science-direct and Google scholar were searched for the articles published between 2013 to 2023 using the keywords "quality of life", "bipolar disorder", "mania" and "hypomania". The articles were uploaded on Mendley and duplicates were removed. The remaining articles were screened on the basis of title and abstract and then sought for retrieval. The retrieved articles

were assessed for further eligibility on the basis of inclusion and exclusion criteria. The inclusion criteria were the articles in English language with free full text availability, articles evaluating the quality of life in BD patients, cross sectional studies, case control studies, randomized control trials and cohort studies. The exclusion criteria were the articles about the treatment of BD, case series, case reports, conference papers, editorial reviews, systematic reviews and grey literature. Following the application of these criteria, the final articles were obtained to be included in our systematic review for data extraction.

RESULTS:

Using our research strategy, we initially found 1524 articles. Firstly, 39 duplicates were removed yielding 1485 articles out of which 1423 articles were excluded on the basis of title and abstract, 16 on the basis of un-

availability of full text, 17 on the basis of irrelevance to Quality of life and 15 on basis of irrelevant study designs. Consequently, 14 studies were finally included which fulfilled the inclusion criteria.

Among 14 selected articles, 8 were cross sectional studies^{3,4,6,10,14,18,20,21}, 1 was longitudinal study⁵, 1 was cohort study¹⁷, 2 were case control studies^{12,16}, 1 study was secondary analysis¹⁵ and 1 study was qualitative research¹⁹ as represented by bar diagram (figure2) .The studies were conducted in different parts of the world including USA^{3,10,4},UK^{3,12}, Canada³, Japan^{10,12,20}, Germany¹⁸, Sweden¹⁷, Sri Lanka¹⁴, Spain¹⁵, Brazil⁵, Norway¹⁶, Denmark¹⁹, Sapparo²⁰, Italy²¹, Uganda⁶, Australia³.

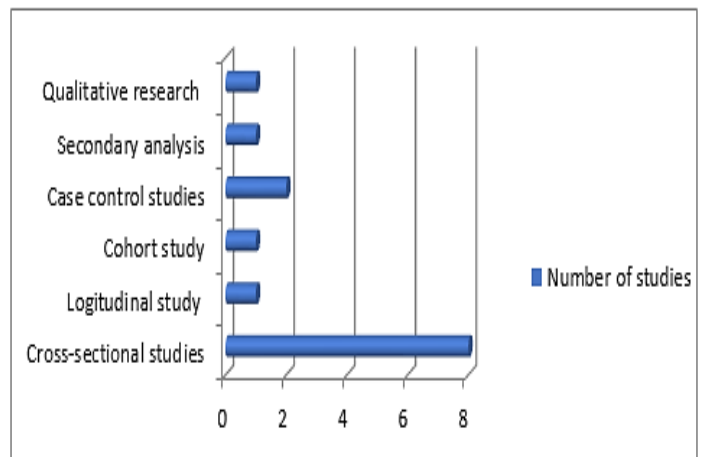


Figure 2: Study Designs

The included studies consisted of a total of 2524 participants diagnosed with BD I or BD II. Among these, 1567(62.08%) were males and 957 (37.91%) were females.

A variety of scales were used for the assessment of quality of life in BD patients. WHO QOL-BREF scale was used in 2 articles^{5, 14}, Health survey short form -36 (SF-36) was used in 3 articles^{6, 15,20}, SF-12 was used in 2 articles^{4,21}. The other scales used in different articles were Global Assessment of Functioning GAF (2 artic

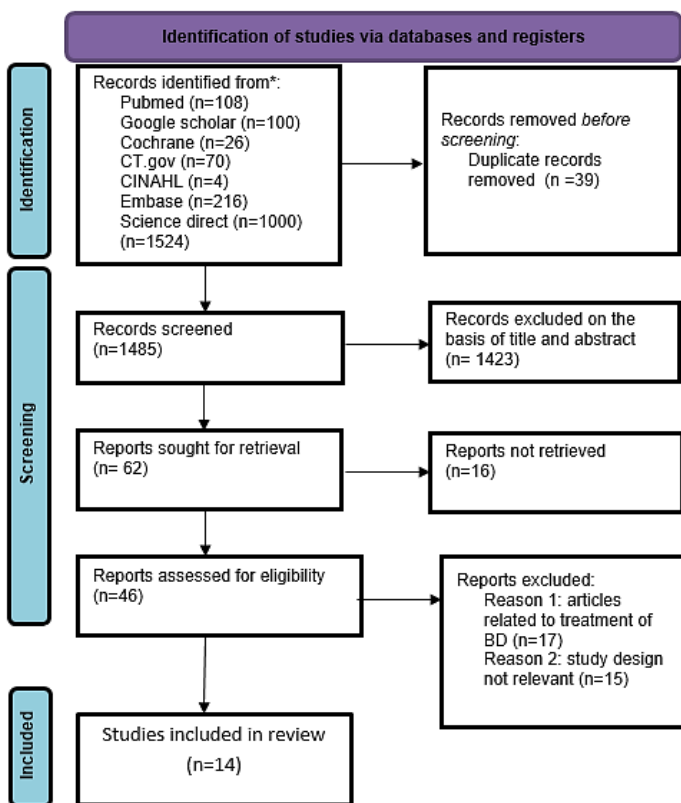


Figure 1: Identification of studies via databases

les^{15,17}), EQ-5D-5L (1 article¹⁰), BD Symptom Scale (1 article³), RS-25 (1 article¹²) and MSCEIT (1 article¹⁸). The included articles revealed the impact of BD on various domains of QOL. The physical domain of QOL was affected in BD patients according to 10 articles^{3, 4, 6, 10, 12, 14, 15-17,21} with major consequences being sleep disturbances (insomnia, hypersomnia) and exhaustion. 12 articles^{3-6, 10, 12, 14-16, 19-21} reported significant impact on psychological domain in BD patients manifested predominantly as anxiety, depression, suicidal ideations and cognitive failures. 4 articles^{12,14,18,19} reported poor social relations, loneliness and social isolation in BD patients. Environmental domain of QOL was affected in BD patients according to 1 article only¹². Moreover, 8 articles^{4,5,10,14,15,17,19,20} revealed low levels of independence in BD patients with high levels of presenteeism and absenteeism along with impaired work productivity. Only 1 article¹⁹ reported the impact on spiritual domain of QOL.

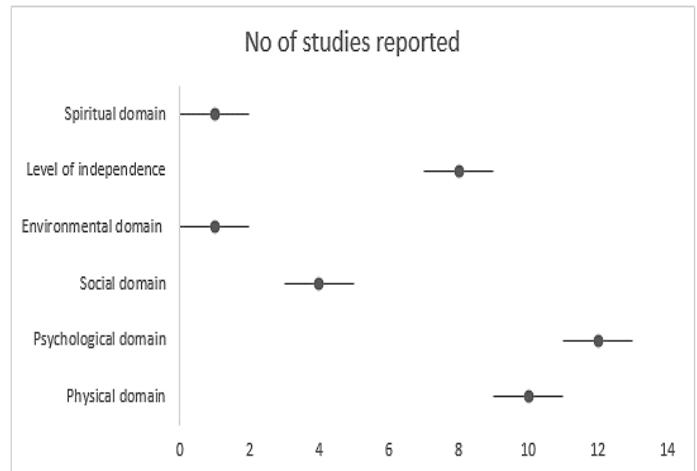


Figure 4: Forest Plot

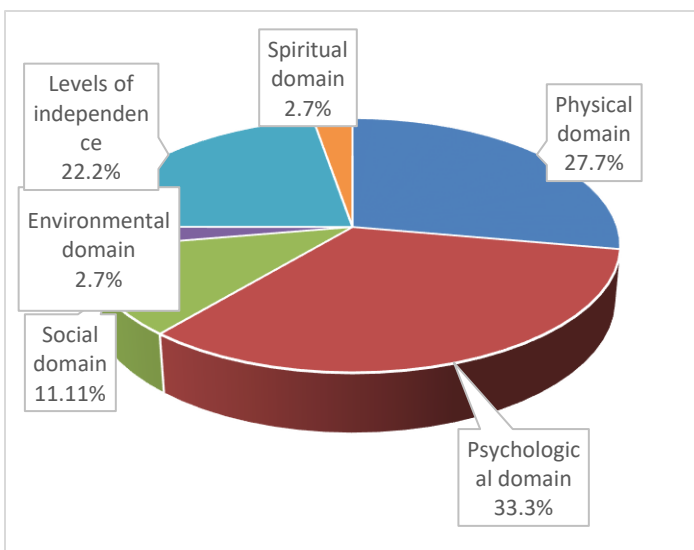


Figure 3: Domains of QOL affected in BD Patients

Table A: Characteristic Features of Included Studies

Sr. No.	Author Year of Publication	Study Design	Country /city	Age Range	Gender	Assessment of Quality of Life (QOL)				
						Domains of QOL affected			Level of independence	Spiritual
Physical	Psychological	Social	Environmental							
1.	Gamage, Nilanga ¹⁴ 2020	Cross sectional study	Sri Lanka	18 - 65 years	Male(54.5%)& Female (45.5%)	Significant sleep disturbances reported.	Anxiety and increased suicidal risks reported.	Poor QOL in unmarried and unemployed.		Worse overall functioning seen.
2.	Kato, Tadafumi ¹⁰ 2021	Cross sectional	Japan, USA	>18	Male (47.9%) & female (55.3%)	Impairment of physical activity reported.	Depressive symptoms in younger and unmarried patients.			High levels of presenteeism absenteeism, impaired work productivity.
3.	O'Rourke, Norm ³ 2021	Cross sectional	UK, US, Canada, Ireland, Australia, South Africa	50-87 years	Male (37%) & female (63%)	Somatic symptoms such as exhaustion reported.	Subjective & perceived cognitive failures usually in hypomanic states.			
4.	De la Fuente-Tomás, Lorena ¹⁵ 2018	Secondary analysis	Spain	>17 years	Male (67.7%) & Female (32.3%)	Sleep disturbances.	Sleep dissatisfaction despite getting adequate sleep).			Overall worse functioning in long term sleepers.
5.	Post, Fabienn ¹² 2018	Case control study	Austria, Japan, UK	18-65 years	Male (41.6%) & Female (58.3%)	Resilient BD patients showed better physical health.	Psychological depression reported.	Internalized stigma led to poor social functioning.	Higher resilience was correlated with high QOL in leisure time activities.	
6.	Khafif, Tatiana Cohab ⁵ 2021	Longitudinal study	Brazil	18-70 years	Males (33.3%) & Female (66.6%)		Depressive BD patients showed lower while manic patients showed better QOL.			BD patients dependent upon drugs and alcohol showed poor QOL.
7.	Gamage, Nilanga ¹⁴ 2020	Cross sectional study	Sri Lanka	18 - 65 years	Male(54.5%)& Female (45.5%)	Significant sleep disturbances reported.	Anxiety and increased suicidal risks reported.	Poor QOL in unmarried and unemployed.		Worse overall functioning seen.
8.	Kato, Tadafumi ¹⁰ 2021	Cross sectional	Japan, USA	>18	Male (47.9%) & female (55.3%)	Impairment of physical activity reported.	Depressive symptoms in younger and unmarried patients.			High levels of presenteeism absenteeism, impaired work productivity.
9.	O'Rourke ³ 2021	Cross sectional	UK, US, Canada, Ireland, Australia, South Africa	50-87 years	Male (37%) & female (63%)	Somatic symptoms such as exhaustion reported.	Subjective and perceived cognitive failures usually in hypomanic states.			
10.	De la Fuente-Tomás, Lorena ¹⁵ 2018	Secondary analysis	Spain	>17 years	Male (67.7%) & Female (32.3%)	Sleep disturbances.	Sleep dissatisfaction (despite getting adequate sleep).			Overall worse functioning in long term sleepers.

11.	Post, Fabienn ¹² 2018	Case control study	Austria , Japan, UK	18-65 years	Male (41.6%) Female (58.3%)	Resilient BD patients showed better physical health.	Psychological depression reported.	Internalized stigma led to poor social functioning.	Higher resilience was correlated with high QOL in leisure time activities.	
12.	Khafif, Tatiana Cohab ⁵ 2021	Longitudinal study	Brazil	18-70 years	Males (33.3%) & females (66.6%)		Depressive BD patients showed lower while manic patients showed better QOL.			BD patients dependent upon drugs and alcohol showed poor QOL.
13.	Laskemoe ,Jannicke Fjæra ¹⁶ 2019	Case control study	Norway	22-46 years	Male(4 0.4%)& female (59.54 %)	Sleep disturbances were associated with poor functioning and QOL.	Depressive symptoms were reported.			
14.	Smedler, Erik ¹⁷ 2023	Cohort study	Sweden	30-65 years	Males (99.8%) & females(0.00 1%)	Patients with higher premorbid intelligence had higher levels of functioning and QOL.				Patients with higher premorbid intelligence had higher degrees of employment.
15.	Frajo-Apor, Beatrice ¹⁸ 2021	Cross sectional study	Germany	18-65 years	Male (55%) & female (45%)			Low levels of emotional intelligence in cases compared to controls.		
16.	Lee Mortensen Gitte ¹⁹ 2015	Qualitative study	Denmark	Not defined	Male(5 0%)& females(5 0%)		Suicidal ideations and attempts reported.	Social isolation and loneliness.		Low self-esteem in BD patients. Feelings of guilt and hopelessness
17.	Kuniyoshi Toyoshima ²⁰ 2014	Cross-sectional study	Sapparo , Japan	18-64 years	Male (45%) & Female (55%)		Patients with subjective and objective cognitive dysfunction showed poor QOL.			Better compliance to medicine in euthymic BD patients.
18.	Kristen M. Abraham ⁴ 2012	Cross-sectional study	USA		Male(7 1.63%) &Female(28.36 %)	The higher the self-efficacy, the better the physical QOL.	Better mental health was associated with higher self-efficacy			The higher the self-efficacy,the more independent the patient is.
19.	Batya Engel-Yeger ²¹ 2014	Cross-sectional study	Italy	16-85 years	Male (40%)& Female(60%)	Better performance of daily physical activities with better coping strategies.	Better copying strategies predict better mental health.			
20.	Any Anyayo, L ⁶ 2021	Cross sectional study	Uganda	25-55 years	Male(45. 56%) & Female(54.43%)	Poor physical QOL.	Poor mental QOL.			

DISCUSSION:

Although many of the articles included in our review validate that there is a multifaceted relation between BD and QOL, most of them claim that there is poor QOL in BD patients compared with the general population. Psychological and physical domain of QOL are affected the most in BD. There is also a significant impact upon social domain and levels of independence. However, environmental and spiritual domains of QOL are least influenced by BD. Quality of life is also affected differently during certain phases of BD. QOL is better during manic and euthymic phases and worst during depressive phase.

Depressive phase of BD is associated with poorer psychological QOL in comparison to the manic phase of BD⁵. It is usually characterized by gloominess, irritability, suicidal ideation, somatic disturbances and negative outlook towards life²². The patients who have more depressive symptoms, are usually younger, unmarried and without a university degree¹⁰. Higher levels of stress causes a disturbed circadian rhythm which further deteriorates the mental health and leads to poor prognosis¹⁴. These findings are in accordance with a previously conducted research stating that BD patients suffer from poor mental and physical health²³.

Distorted sleep patterns are a major culprit in worsening the QOL. Sleep disturbances have a significant effect on HRQOL²⁴. They are associated with more severe depressive symptoms in BD patients¹⁶. Another study has declared half of the subjects suffering from BD as “impaired sleepers” owing to sleep disturbances¹⁵. A recent study has also suggested that sleep deprivation initiates psychiatric symptoms and plays a role in progression of bipolar disorder. Moreover, these sleep disorders have been reported even in euthymic phase of BD.²⁵

Psychological and social domain is affected even in remission states¹². Patients with BD experience not only subjective but also objective cognitive dysfunctioning²⁰. The patients with mixed states have reported social isolation, loneliness, low self-esteem and feelings of guilt and hopelessness¹⁹. An earlier study has also analyzed the mixed states in bipolar disorder

and thus has confirmed the severe reoccurrence of psychiatric symptoms such as suicidal tendencies, anxiety attacks and depression in BD patients.²⁶

The articles included in our study are quite heterogeneous with certain articles supporting the idea that quality of life is not much affected in BD patient. As reported, WHOQOL-BREF assessments are not significantly different from each other in any of the subdomains suggesting that changes in QOL may not be as significant as expected⁵. The idea has been proven by a previous qualitative study stating that some subjects continue to do exceptionally well despite having being diagnosed with BD. In fact, BD provided them with better opportunities in terms of career and socialization²⁷.

There is a negative correlation between QOL and internalized stigma; the lesser the stigma, the better the QOL¹². The society is still reluctant to address mental illnesses due to enormous stigma associated with it²⁸. However, the recent advances in media and technology have started to revolutionize society’s perspective towards psychiatric illnesses²⁹. BD patients show low levels of emotional intelligence as compared to healthy controls. However, the subjects with higher premorbid intelligence find it easy to cope with their day to day life¹⁷. Lower age and lower sensitivity in BD leads to higher scores on physical domain of QOL, meanwhile, coping strategies have proven to be beneficial for improvement of mental health²¹.

Our systematic review included articles from various parts of the world which gave a more generalized overview of impact of BD on QOL rather than in a specified population. Factors like routine, independence and social support, which were shown to have a significant effect on QOL, have not been taken into account while assessing the quality of life. Effect of physical and mental co-morbidities on QOL of BD patients has not been discussed in our study. Moreover, most of the articles had included patients irrespective of their phase of illness, the results were affected by their state of illness thus lessening the quality of our included articles. A variety of QOL assessment tools and multiple study designs were used in different

articles which made evaluative comparisons quite difficult.

CONCLUSION:

In the past few years, major achievements in the pharmacological control of BD patients have been done, thus diverting our attention to increasing the quality of life of BD patients. Our systematic review chiefly gives information about how BD negatively affects QOL in all domains of life (physical, psychological, social, levels of independence, environmental and spiritual). While most of the articles are of the view that BD has a profound negative impact on QOL, some articles have also hypothesized that QOL in BD may not be as much affected as was previously assumed. This tells us that there is a multi-faceted relationship between QOL and BD.

In recent years bipolar disorder has become an important health concern not only for individuals with BD but also for our society, thus more studies evaluating QOL in bipolar disorder should be further conducted. Such knowledge can help us develop those therapeutic interventions that can ameliorate not only physical symptoms, but also improve functioning and QOL in BD patients.

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REFERENCES:

1. What are bipolar disorders? [Internet] Psychiatry.org - What Are Bipolar Disorders? [Cited Aug 12 2023]. Available from: <https://www.psychiatry.org/patients-families/bipolar-disorders/what-are-bipolar-disorders>.
2. Miller S, Dell'Osso B, Ketter TA. The prevalence and burden of bipolar depression. *Journal of Affective Disorders*. 2014;169(1):3-11.
3. O'Rourke N, Sixsmith A, Kirshner G, Osher Y. Perceived cognitive failures and quality of life for older adults with bipolar disorder. *Journal of Affective Disorders*. 2021;287(1):433-40.
4. Abraham KM, Miller CJ, Birgenheir DG, Lai Z, Kilbourne AM. Self-efficacy and quality of life among people with bipolar disorder. *Journal of Nervous & Mental Disease*. 2014;202(8):583-8.
5. Khafif TC, Belizario GO, Silva M, Gomes BC, Lafer B. Quality of life and clinical outcomes in bipolar disorder: An 8-year Longitudinal Study. *Journal of Affective Disorders*. 2021;278(1):239-43.
6. Anyayo L, Ashaba S, Kaggwa MM, Maling S, Nakimuli-Mpungu E. Health-related quality of life among patients with bipolar disorder in rural southwestern Uganda: A Hospital Based Cross Sectional Study. *Health and Quality of Life Outcomes*. 2021;19(1):1-8.
7. Vieta E, Berk M, Schulze TG, Carvalho AF, Suppes T, Calabrese JR, et al. Bipolar disorders. *Nature Reviews Disease Primers*. 2018;4(1):1-16.
8. Warner A, Holland C, Lobban F, Tyler E, Harvey D, Newens C, et al. Physical health comorbidities in older adults with bipolar disorder: A systematic review. *Journal of Affective Disorders*. 2023;326(1):232-42.
9. Carbone EA, de Filippis R, Caroleo M, Calabrò G, Staltari FA, Destefano L, et al. Antisocial personality disorder in bipolar disorder: A systematic review. *Medicina*. 2021;57(2):1-15.
10. Kato T, Baba K, Guo W, Chen Y, Nosaka T. Impact of bipolar disorder on health-related quality of life and work productivity: Estimates from the National Health and Wellness Survey in Japan. *Journal of Affective Disorders*. 2021;295(1):203-14.
11. Zaheer A, Sharif F, Khan Z, Batool S, Iqbal H. Quality of Life and Depression among Lower Limb Amputees. *Ann King Edw Med Univ*. 2020;26(2):364-8.
12. Post F, Pardeller S, Frajo-Apor B, Kemmler G, Sondermann C, Hausmann A, et al. Quality of life in stabilized outpatients with bipolar I disorder: Associations with resilience, internalized stigma, and residual symptoms. *Journal of Affective Disorders*. 2018;238(1):399-404.

13. Martín Subero M, Berk L, Dodd S, Kamalesh V, Maes M, Kulkarni J, et al. Quality of life in bipolar and schizoaffective disorder—a naturalistic approach. *Comprehensive Psychiatry*. 2014;55(7):15-40–5.
14. Gamage N, Senanayake S, Kumbukage M, Mendis J, Jayasekara A. The prevalence of anxiety and its association with the quality of life and illness severity among bipolar affective disorder patients in a developing country. *Asian Journal of Psychiatry*. 2020;52(1):1-6.
15. De la Fuente Tomás L, Sierra P, Sanchez Autet M, García Blanco A, Safont G, Arranz B, et al. Sleep disturbances, functioning, and quality of life in EUTHYMIC patients with bipolar disorder. *Psychiatry Research*. 2018;269(1):501–7.
16. Laskemoen JF, Simonsen C, Büchmann C, Barrett EA, Bjella T, Lagerberg TV, et al. Sleep disturbances in schizophrenia spectrum and bipolar disorders – A trans diagnostic perspective. *Comprehensive Psychiatry*. 2019;91(1):6–12.
17. Smedler E, Sparding T, Jonsson L, Hörbeck E, Landén M. Association of premorbid intelligence with level of functioning and illness severity in bipolar disorder. *Journal of Affective Disorders*. 2023;324(1):449–54.
18. Frajo Apor B, Pardeller S, Kemmler G, Mühlbacher M, Welte AS, Hörtnagl C, et al. The relationship between emotional intelligence and quality of life in schizophrenia and bipolar I disorder. *Quality of Life Research*. 2021;30(9):24-75–85.
19. Lee Mortensen G, Vinberg M, Lee Mortensen S, Balslev Jørgensen M, Eberhard J. Bipolar patients' quality of life in mixed states: A preliminary qualitative study. *Psychopathology*. 2015;48(3):1-92–201.
20. Toyoshima K, Kako Y, Toyomaki A, Shimizu Y, Tanaka T, Nakagawa S, et al. Associations between cognitive impairment and quality of life in EUTHYMIC bipolar patients. *Psychiatry Research*. 2019;271(1):510–15.
21. Engel Yeager B, Gonda X, Muzio C, Rinosi G, Pompili M, Amore M, et al. Sensory processing patterns, coping strategies, and quality of life among patients with unipolar and bipolar disorders. *Revista Brasileira de Psiquiatria*. 2016;38(3):207–15.
22. Afzal S, Akhtar M, Abid M. Depression in medical students a cross-sectional study in a public sector institution. *Ann King Edw Med Univ*. 2014 ;20(2)-:149-58.
23. Gutierrez Rojas L, Gurpegui M, Ayuso-Mateos JL, Gutierrez Ariza JA, Ruiz Veguilla M, Jurado D. Quality of life in Bipolar disorder patients: A comparison with a general population sample. *Bipolar Disorders*. 2008;10(5):625–34.
24. Malik N, Muazzam A. Sleep Disorders as Predictor of Health-Related Quality of Life in Patients with COPD. *Ann King Edw Med Univ*. 2018;24(S):-897-901.
25. Steardo L, de Filippis R, Carbone EA, Segura Garcia C, Verkhatsky A, De Fazio P. Sleep disturbance in bipolar disorder: Neuroglia and circadian rhythms. *Frontiers in Psychiatry*. 2019;10(1):1-12.
26. Swann AC, Lafer B, Perugi G, Frye MA, Bauer M, Bahk W-M, et al. Bipolar mixed states: An International Society for Bipolar Disorders Task Force Report of symptom structure, course of illness, and diagnosis. *American Journal of Psychiatry*. 2013;170(1):31–42.
27. Michalak EE, Yatham LN, Kolesar S, Lam RW. Bipolar disorder and quality of life: A patient-centered perspective. *Quality of Life Research*. 2006;-15(1):25–37.
28. Aziz K, Afridi HK, Khichi ZH. Psychological autopsy study of suicide pattern and its relationship to depressive illness. *Ann King Edw Med Univ*. 2016;12(1):121-23.
29. Azad N, Mansoor S, Abbas N, ul Ain Q. Association of Attitude Towards Mental Illness with Exposure to Psychiatry in Medical Students. *Ann King Edw Med Univ*. 2022;28(2):146-51.