ORIGINAL ARTICLE

Morbidity Pattern in Psychiatric Ward in a Tertiary Care Hospital in Eastern Nepal

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Abstract

Introduction: *Worldwide, the morbidity of psychiatric illnesses is on the rise. Quality in-patient services are a part of quality mental health services provision. Knowledge about the pattern of illness among patients admitted to the ward could help the service providers to plan better and provide better services. This study was undertaken to explore the clinico-demographic profile of patients admitted to psychiatric ward at BPKIHS..*

Material And Method: *This is a hospital based retrospective and cross-sectional study. After ethical approval from the Institutional Review Committee, the data of all patients admitted to Psychiatry Ward from 1st January 2007 to 31st December 2016 were collected from the data-base of Medical Records Section. The diagnoses were made according to the ICD-10 criteria. 3687 admissions were processed for the analysis.*

Results: *Of the 3687 admissions, 2183(59.2%) were male and 1504 (40.8%) were female. The age range was 4-92 years with mean age of 32.4(±12.6)years. The majority of the admissions (62.5%) were from Sunsari (1159,31.4%) and surrounding districts (1147,31.1%). Mood disorders were the commonest diagnoses 1788(48.5%) followed by schizophrenia, schizotypal and delusional disorders 829(22.5%) and psychoactive substance use disorders 813(22.1). 92% of patients admitted were improved on discharge and three cases expired in the ward. Out of 3687 admissions, 957(26%) were readmissions.*

Conclusion: *Mood disorders were the commonest diagnosis among the admitted patients. Outcome of hospital stay was good with 92% discharged in improved condition and only three mortalities in 10 years duration. Address seems to significantly affect the service utilization.*

Keywords: Psychiatric illness, Inpatient, Nepal

INTRODUCTION

Worldwide, the morbidity of psychiatric illnesses is on the rise.[1] However, the gap of the need for mental health services and the provision of available services is vast and even many of those who do get the services do not get quality services.[1] Modern mental health services in Nepal started almost fifty years back but still the services are grossly inadequate. In-patient psychiatric services in Nepal are being provided mainly in the psychiatric units of medical colleges and university hospitals and some private hospitals but this is grossly inadequate. The WHO-AIMS report reported 17 community-

based psychiatric inpatient units were available in the country for a total of 1.00 beds per 100,000 population and treated 3.91 patients per 100,000 population.[2] A recent study reported a total of 1.5 beds per 100,000 population and just 60 psychiatrists for a population of almost 30 milllions.[3] The psychiatric department of B.P. Koirala Institute of Health Sciences(BPKIHS), Dharan(with 30 beds capacity) and Koshi Zonal Hospital, Biratnagar (with 4 beds capacity) had been the only facilities providing in-patient services to the entire population of 5.83 millions[4] in the Eastern Development Region till eight years back. Some additional beds are now available in other private medical colleges and private hospitals.

Quality in-patient services are a part of quality mental health services provision. Longer in-patient stays could lead to higher direct and indirect costs and it could also isolate the patient from their social networks leading to maladaptive processes in the patients. [5] Moreover in context of Nepal where the health care spending is mainly based on out-of-pocket money, it could lead to catastrophic costs further compounding the situation. The average psychiatric in-patient Length of Stay(LoS) in Nepal was found to be 18.85 days.[2] In Nepal, the average cost of antipsychotic or antidepressant medicines was found to be around 8% of the daily wage of a labourer.[2] Various factors including socio-demographic, clinical and system-based parameters have been found to affect the length of stay among patients admitted to psychiatric wards.[6-11] Mental disorders have been associated with longer duration of stay than physical disorders. [12] Similarly, psychosis, female gender and larger hospital size were associated with longer hospital stay while discharge against medical advice, young or middle ages, being detained and being married were some of the factors associated with shorter hospital stay.[11] Goldstein et al. have suggested that in addition to diagnosis, other factors such as age and treatment setting contribute to long stays and high costs.[13] In another study done in South London, the mean age of the patients was 39.1 yrs (SD±12.4) with 56% of patients being male. Psychotic disorders (Schizophrenia and other psychotic disorders-42%) were the commonest diagnosis followed by mood disorders (28%),

drugs and alcohol disorders (11%), neurotic and anxiety disorders (9%) and personality disorders (6%).[14]

Knowledge about the clinico-demographic profile of the patients admitted to psychiatric wards could help the service providers as well as the administrators to plan better and provide better services.

MATERIAL AND METHOD

This was a retrospective cross-sectional study conducted at B. P. Koirala Institute of Health Sciences(BPKIHS), Dharan with the objective of knowing the morbidity pattern of patients admitted to the psychiatric ward at BPKIHS along with sociodemographic profile. BPKIHS is the tertiary referral centre in the Eastern Development Region of Nepal. The psychiatric department of the institute provides out-patient, in-patient, 24-hour emergency services and consultation liaison services. The department has 30 bed capacity in-patient ward. The psychiatric diagnoses of all patients admitted in the ward are made according to the ICD-10 CDDG criteria by consultant psychiatrists after adequate detail work up. The medical record section of the institute keeps a well maintained electronic database with records of all in-patients according to the ICD-10 diagnostic categories. The study protocol was submitted to the Institutional Review Committee and ethical approval was taken. The data of all patients admitted to the psychiatry ward from 1st January 2007 to 31st December 2016 were extracted from the database of the medical record section using all precautions to conceal any identity of the patients. The data were entered into MS Excel, cleaned and processed for analysis using the SPSS version 11.5. There were a total of 3699 admissions during the study period out of which two were mistake admissions and ten admissions were cancelled the same day. These twelve admissions were excluded from the study and remaining 3687 admissions were analyzed. For descriptive statistics, percentage, mean, range and standard deviation were calculated and presented in tabular and graphical presentation.

RESULT

There were a total of 3687 admissions. There were 1504 (40.8%) female admissions and

2183(59.2%) male admissions of which 2730(74%) were single admission and 957(26%) readmissions.

Table 1: Socio-demographic Characteristics of the Subjects

Characteristics	Categories	No of Patients	Percentage
Age Group	Children and Adolescents	497	13.5
	Adults	3058	82.9
	60years and above	132	3.6
Gender	Female	1504	40.8
	Male	2183	59.2
Address	Sunsari	1159	31.4
	Surrounding Districts of Sunsari	1147	31.1
	Other Eastern Terai Districts and others	964	26.1
	Other Eastern Hill Districts	417	11.3
Religion	Hindu	3258	88.4
	Buddhist	56	1.5
	Christian	53	1.4
	Kirat	198	5.4
	Islam	42	1.1
	Others	80	2.2
Occupation	Unemployed	347	9.4
	Self employed	938	25.4
	Service holder	147	4.0
	House wife	1057	28.7
	Farmer	580	15.7
	Students	604	16.4
	Not mentioned	14	0.4

The mean age of the patients was 32.4 years(±12.6) with age range from 4-92 years and old age constituted 3.6% of the admissions. Majority of patients(62.5%) were from Sunsari and surrounding districts, with almost one-third(31.4%) from Sunsari district alone.

Majority (88.4%) of patients were Hindu by religion. Housewives constituted 28.7% of the admissions and only 9.4% were recorded to be unemployed. Mood disorders were the commonest diagnosis(48.5%) followed by schizophrenia, schizotypal and delusional disorders(22.5%) and psychoactive substance use disorders(22.1%). Psychiatric diagnosis was missing in 61 patients(1.7%) that could be because of error in entering the diagnoses into the database as all those missing cases had one or other medical co-morbidity. Psychiatric co-morbidities were recorded in 6% of the cases and medical co-morbidity was noted in 320(8.7%) of the admissions. 66(1.8%) admissions had diagnosis of suicidal attempts. The frequency of admissions was maximum(10.2%) in the month of March and minimum(6.6%) in September while LoS was maximum(21.8days) in May and minimum(17.7%) in March. The mean LoS during the study period was 19.4 days(±13.1) with range of 1-124 days. The bed occupancy rate was 65.2%. The overall outcome during the study period was good with 92% patients discharged in improved state and only three(0.1%) deaths in ten years period. Similarly, all patients who had expired had medical co-morbidity. Those with mixed diagnosis were younger(mean age-30.29 years) as compared to those with single diagnosis and the association was significant(p=0.009). Similarly, females were younger(mean age 31.8 years) as compared to males(mean age 32.9 years) in our study sample and the association was significant(p=0.008).

DISCUSSION:
According to the Nepal Census 2011,[15] the male to female ratio in the Eastern Development Region was 92.37:100 but in our study, more males(59.2%) were admitted as compared to females. The WHO-AIMS study in Nepal had found that 54% of inpatients were male.[2] Similar findings have been noted by other studies,[7,16,17]

Table 1: Clinical Characteristics of the Subjetcs

Characteristics	Categories	No. of Patients	Percentage
Length of Stay	7days	468	12.7
	8-14days	1102	29.9
	15-28days	1446	39.2
	>28days	671	18.2
Disease Category	Organic, including symptomatic, mental disorders	39	1.1
	Mental and behavioural disorders due to psychoactive substance use	813	22.1
	Schizophrenia, schizotypal and delusional disorders	829	22.5
	Mood Disorders	1788	48.5
	Neurotic, stress-related and somatoform disorders	99	2.7
	Others	25	0.7
	Suicide attempt	33	0.9
	Not mentioned	61	1.7
Outcome	Absconded	119	3.2
	Expired	3	0.1
	Improved	3392	92.0
	LAMA	139	3.8
	Others	34	0.9
Admission from	Psychiatry OPD	3568	96.8
	Medicine Ward	98	2.7
	Others (Gynae and Obstetrics, ENT, Surgery, Ortho)	21	0.6
Medical Co-morbidity	No	3367	91.3
	Yes	320	8.7
Readmission	No	2730	74.0
	Yes	957	26.0

One of the reasons for this male-female differences in our study could be gender discrimination towards females as it's one of the major social problems in Nepal.[18,19] According to the national census 2011, the age group distribution was 40% children and adolescents, 51% adults and 9% 60 years and above.[15] The distribution in our study sample consisted of 13.5% children and adolescents, 82.9% adults and 3.6% 60years and above, indicating proportionately more patients in the age group 20-59 years were being admitted. In a study done by Donisi et al 11% patients were of age group >65 years while the remaining was of 15-64 years age group.[20] The mean age in our study was 32.4(±12.6)years. It is similar to the findings in study by Appleby et al.[21] who found the mean age of patients to be 35.4(±11.7) years but much less than that in the study by Baeza et al who found the mean age to be 43.8years.[16] In our study 31.4% of patients were from Sunsari district alone, 31.1% from surrounding districts of Sunsari, 26.1% from other Eastern Terai districts and only 11.3% from other Eastern Hill districts. However, according to the 2011 census,

the population distribution in the eastern region was 13% in Sunsari District, 36% in surrounding districts of Sunsari, 25% in other Terai districts and 26% in other Eastern Hill districts. Also, of those from Sunsari district, 51% were from Dharan Municipality only, the place where BPKIHS is located, while Dharan constituted only 16% of the total population of Sunsari as of 2011 census.[15] This disproportionately high representation from Sunsari district and Dharan Municipality could be attributed to the location of the hospital in the Sunsari district and Dharan municipality itself, thereby allowing easier access. Several studies have shown that increase in distance decreases the likelihood of service utilization in mental health.[22-27] Zulian et al reported the caseload decreased with increasing distance and found a 60% decrease in inpatient wards at a distance of 10km.[26] Majority of patients(88.4%) were Hindu by religion followed by Kirat(5.4%). The effect of seasonality in the hospital admission rate and LoS has been reported by many studies. [28-32] In our study, there were more admissions during month of March(10.2%) as compared to other

months. The length of stay was maximum(21.8 days) in May and minimum(17.7 days) in March and there was significant association of LoS with month of admission. Our findings of maximum LoS during May is similar to the findings by G. Singh et al in India that had found that the bed occupancy rate and LoS were both high in the summer months(May-July).[30] In our case, May falls in summer season in Nepal and our findings are matching with this study.

Regarding the diagnostic categories, mood disorders were the commonest (48.5%) followed by schizophrenia and substance use disorders. Affective disorders have been reported as the commonest diagnostic category in other studies as well.[16,20,33] Baeza et al reported mood disorders(60.3%) to be the commonest disorder in their study followed by schizophrenia and related disorders(28.8%) and neurotic, stress-related and somatoform disorders(3.4%).[16] Similarly, Barros et al reported in their study from Brazil that in general hospital, mood disorders were the commonest(43.5%) followed by psychotic disorders(29.3%), alcohol and other substance related disorders(10.1%) and others(7.4%).[33] In our study, the mean LoS was 19.4(±13.2)days with majority(70.1%) of LoS of 8-28days, followed by >28days(18.2%) and 1-7days(12.7%). Our findings is similar to the findings of Barros et. al from Brazil who found that the mean LoS in general and psychiatric hospitals were 20.5±34.2days and 20.9±68.6 days respectively.[33] There was relatively less psychiatric co-morbidity(6.1%) recorded in our study though psychiatric co-morbidity have been reported as high as 45%.[34] In our clinical practice also, we see co-morbid psychiatric illnesses more frequently. Similarly, medical co-morbidity was reported less in our case as compared to other studies.[35] The reason for this low finding could be because of lack of clear protocol to record the co-morbid illnesses in the database. In our study, 26% of admissions were readmission cases. Donisi et al[36] reported a 90days readmission rate of 32.5% in their study from Italy while Hodgson et al[37] reported 41% readmission rate at 5years. The findings of our study is much lower than both these studies. Both the studies have been done in developed country setting where health systems are stronger and loss to follow up might be less as compared to our resource poor setting.

One of the major limitations of our study is being a retrospective, cross-sectional study, we could not find the causal association among various factors. Similarly, as the data was extracted from database, some of the inherent shortcomings of the database like poor recording of the co-morbidities have been reflected in this study.

CONCLUSION:

There were a total of 3877 admissions during the study period. The admissions from Sunsari district and Dharan municipality were disproportionately high indicating that proximity and access to the facility greatly determine the utilization of mental health services. The overall outcome was good with only three mortality in ten years despite regularly managing delirium tremens cases in the ward itself and 92% patients being discharged in improved state. Mood disorders were the commonest diagnosis followed by schizophrenia and related disorders.

CONFLICT OF INTEREST: None

REFERENCES:

1. WHO | Mental Disorders [Internet]. WHO. World Health Organization; 2017 [cited 2017 Jul 20]. Available from: http://www.who.int/mediacentre/factsheets/fs396/en/
2. WHO-aims report on mental health system in Nepal. Kathmandu: World Health Organization; 2006.
3. Luitel NP, Jordans MJD, Adhikari A, Upadhaya N, Hanlon C, Lund C, et al. Mental health care in Nepal: Current situation and challenges for development of a district mental health care plan. Confl Health. 2015;9(1):1–11.
4. Central Beureau of Statistics (CBS). Nepal Census 2011 Preliminary Report [Internet]. Kathmandu; 2011. Available from: www.cbs.gov.np
5. Stevens A, Hammer K, Buchkremer G. A statistical model for length of psychiatric in-patient treatment and an analysis of contributing factors. Acta Psychiatr

Scand [Internet]. 2001 Mar;103(3):203–11. Available from: http://www.ncbi.nlm.nih.gov/pubmed/11240577

6. *Large MM, Paton MB, Sara G, Wright M, Nielssen OB. Measuring the distribution of the length of stay in acute psychiatric units. J Psychiatr Intensive Care [Internet]. 2012 Aug 5 [cited 2018 Mar 1];8(2):78–87. Available from: http://login.research4life.org/tacsgr1www_cambridge_ org/core/services/aop-cambridge-core/content/view/D8B3D8D2B834496645E4DAB4E E83DF31/S1742646411000227a.pdf/measuring_the_di stribution_of_the_length_of_stay_in_acute_psychiatric _units.pdf*

7. *Newman L, Harris V, Evans LJ, Beck A. Factors Associated with Length of Stay in Psychiatric Inpatient Services in London, UK. Psychiatr Q [Internet]. 2018 Mar 3 [cited 2018 Mar 1];89(1):33–43. Available from: https://link.springer.com/content/pdf/10.1007%2Fs111 26-017-9498-7.pdf*

8. *McCrone P, Phelan M. Diagnosis and length of psychiatric in-patient stay. Psychol Med [Internet]. 1994 Nov 9 [cited 2017 Jul 20];24(4):1025. Available from: https://www.cambridge.org/core/journals/psychological -medicine/article/diagnosis-and-length-of-psychiatric-inpatient-stay/B17407B0D1E72EA68F3E3C4AC9E55E2D#*

9. *Chung W, Oh SM, Suh T, Lee YM, Oh BH, Yoon CW. Determinants of length of stay for psychiatric inpatients: Analysis of a national database covering the entire Korean elderly population. Health Policy (New York). 2010;94(2):120–8.*

10. *Douzenis A, Seretis D, Nika S, Nikolaidou P, Papadopoulou A, Rizos EN, et al. Factors affecting hospital stay in psychiatric patients: the role of active comorbidity. BMC Health Serv Res [Internet]. 2012 Dec 19 [cited 2017 Jul 19];12(1):166. Available from: https://link.springer.com/content/pdf/10.1186%2F1472 -6963-12-166.pdf*

11. *Tulloch AD, Fearon P, David AS. Length of Stay of General Psychiatric Inpatients in the United States: Systematic Review. Adm Policy Ment Heal Ment Heal Serv Res [Internet]. 2011 May 7 [cited 2017 Jul 19];38(3):155–68. Available from: https://link.springer.com/content/pdf/10.1007%2Fs104 88-010-0310-3.pdf*

12. *U.S. Department of health and human services. Health, United States, 2009. With Special Feature on Medical Technology [Internet]. 2010 [cited 2017 Jul 20]. Available from: https://www.cdc.gov/nchs/data/hus/hus09.pdf*

13. *Goldstein JM, Bassuk E., Holland SK, Zimmer D. Identifying catastrophic psychiatric cases: Targeting managed-care strategies. Med Care. 1988;26(8):790–9.*

14. *Tulloch AD, David AS, Thornicroft G. Exploring the predictors of early readmission to psychiatric hospital. Epidemiol Psychiatr Sci [Internet]. 2016 Apr 23 [cited 2017 Jul 22];25(2):181–93. Available from: https://www.cambridge.org/core/services/aop-cambridge-core/content/view/26F3450AE6611EB5C7F8B82F372 1B457/S2045796015000128a.pdf/exploring_the_predic tors_of_early_readmission_to_psychiatric_hospital.pdf*

15. *Central Bureau of Statistics, National Planning Commission G of N. National Population and Housing Census 2011(National Report) [Internet]. Vol. 1, National Population and Housing Census 2011 (National Report). Kathmandu, Nepal; 2012 [cited 2018 Mar 12]. Available from: http://cbs.gov.np/image/data/Population/National Report/National Report.pdf*

16. *Baeza FL, da Rocha NS, Fleck MP. Predictors of length of stay in an acute psychiatric inpatient facility in a general hospital: a prospective study. Rev Bras Psiquiatr [Internet]. 2017 Jul 6 [cited 2018 Mar 1];40(1):89–96. Available from: http://login.research4life.org/tacsgr0www_scielo_br/pd f/rbp/2017nahead/1516-4446-rbp-1516444620162155.pdf*

17. *Lerner Y, Zilber N. Predictors of cumulative length of psychiatric inpatient stay over one year: A national case register study. Isr J Psychiatry Relat Sci [Internet]. 2010 [cited 2017 Jul 19];47(4):304–7. Available from: https://doctorsonly.co.il/wp-content/uploads/2011/12/2010_4_10.pdf*

18. *Pokharel S. Gender Discrimination : Women Perspective. Nepal J Dev Rural Stud [Internet]. 2008;2(5):80–7. Available from: https://www.researchgate.net/publication/215457309_ Gender_Discrimination_Women_Perspective*

19. *Asian Development Bank, ADB. Overview of Gender Equality and Social Inclusion (GESI) in Nepal [Internet]. Mandaluyong, Phillipines: Asian Development Bank; 2010 [cited 2018 Mar 12]. 50 p. Available from: https://www.adb.org/sites/default/files/institutional-document/32237/cga-nep-2010.pdf*

20. *Donisi V, Tedeschi F, Salazzari D, Amaddeo F. Pre- and post-discharge factors influencing early readmission to acute psychiatric wards: Implications for quality-of-care indicators in psychiatry. Gen Hosp Psychiatry [Internet]. 2016;39:53–8. Available from: http://dx.doi.org/10.1016/j.genhosppsych.2015.10.009*

21. *Appleby L, Desai PN, Luchins DJ, Gibbons RD, Hedeker DR. Length of stay and recidivism in schizophrenia: a study of public psychiatric hospital patients. Am J Psychiatry [Internet]. 1993 Jan [cited 2017 Jul 19];150(1):72–6. Available from: http://login.research4life.org/tacsgr0ajp_psychiatryonli ne_org/doi/pdf/10.1176/ajp.150.1.72*

22. *Bürgy R, Häfner-Ranabauer W. Utilization of the psychiatric emergency service in Mannheim: Ecological and distance-related aspects. Soc Psychiatry Psychiatr Epidemiol [Internet]. 1998 Oct 1 [cited 2018 Mar 12];33(11):558–67. Available from: https://link.springer.com/content/pdf/10.1007%2Fs001 270050094.pdf*

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23. McCarthy JF, Valenstein M, Zivin K, Zeber JE, Kilbourne AM. Access-Related Measures and Out-of-System Utilization Among Veterans With Bipolar Disorder. Psychiatr Serv [Internet]. 2010 Oct [cited 2018 Mar 12];61(10):1035–8. Available from: http://login.research4life.org/tacsgr1ps_psychiatryonline_org/doi/pdfplus/10.1176/ps.2010.61.10.1035

24. Sohler KB, Thompson JD. Jarvis' law and the planning of mental health services. Influence of accessibility, poverty, and urbanization on first admissions to Connecticut State hospitals. Public Heal reports (Washington, DC 1896) [Internet]. 1970 Jun [cited 2018 Mar 12];85(6):503–10. Available from: http://login.research4life.org/tacsgr1www_ncbi_nlm_nih_gov/pmc/articles/PMC2031739/pdf/pubhealthreporig01054-0037.pdf

25. Packness A, Waldorff FB, Christensen R dePont, Hastrup LH, Simonsen E, Vestergaard M, et al. Impact of socioeconomic position and distance on mental health care utilization: a nationwide Danish follow-up study. Soc Psychiatry Psychiatr Epidemiol [Internet]. 2017 Nov 28;52(11):1405–13. Available from: http://link.springer.com/10.1007/s00127-017-1437-2

26. Zulian G, Donisi V, Secco G, Pertile R, Tansella M, Amaddeo F. How are caseload and service utilisation of psychiatric services influenced by distance? A geographical approach to the study of community-based mental health services. Soc Psychiatry Psychiatr Epidemiol [Internet]. 2011 [cited 2018 Mar 12];46(9):881–91. Available from: https://link.springer.com/content/pdf/10.1007%2Fs00127-010-0257-4.pdf

27. Stulz N, Pichler EM, Kawohl W, Hepp U. The gravitational force of mental health services: Distance decay effects in a rural Swiss service area. BMC Health Serv Res [Internet]. 2018 [cited 2018 Mar 12];18(1). Available from: https://bmchealthservres.biomedcentral.com/track/pdf/10.1186/s12913-018-2888-1?site=bmchealthservres.biomedcentral.com

28. Federman EJ, Drebing CE, Boisvert C, Penk W, Binus G, Rosenheck R. Relationship Between Climate and Psychiatric Inpatient Length of Stay in Veterans Health Administration Hospitals. Am J Psychiatry [Internet]. 2000 Oct [cited 2018 Mar 13];157(10):1669–73. Available from: https://ajp.psychiatryonline.org/doi/pdf/10.1176/appi.ajp.157.10.1669

29. Fisekovic S, Licanin I, Cesir A. Prevalence of Neurotic, Somatoform and Stress Induced Disorders in Relation to the Seasons and Climatic Factors During the 2010/2011. Mater Socio Medica [Internet]. 2012 [cited 2018 Mar 13];24(3):190. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3732351/pdf/MSM-24-190.pdf

30. Singh G, Chavan B, Arun P, Sidana A. Seasonal pattern of psychiatry service utilization in a tertiary care hospital. Indian J Psychiatry [Internet]. 2007 Apr [cited 2018 Mar 13];49(2):91. Available from: http://www.ncbi.nlm.nih.gov/pubmed/20711389

31. Trang PM, Rocklöv J, Giang KB, Nilsson M. Seasonality of hospital admissions for mental disorders in Hanoi, Vietnam. Glob Health Action [Internet]. 2016 Dec 25 [cited 2018 Mar 13];9(1):32116. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5002036/pdf/GHA-9-32116.pdf

32. Licanin I, Fisekovic S, Babic S. Admission Rate of Patients with Most Common Psychiatric Disorders in Relation to Seasons and Climatic Factors During 2010/2011. Mater Socio Medica [Internet]. 2012 [cited 2018 Mar 13];24(2):94. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3732328/pdf/MSM-24-94.pdf

33. Barros REM, de Azevedo Marques JM, Santos JLF, Zuardi AW, Del-Ben CM. Impact of length of stay for first psychiatric admissions on the ratio of readmissions in subsequent years in a large Brazilian catchment area. Soc Psychiatry Psychiatr Epidemiol [Internet]. 2016 Apr 22;51(4):575–87. Available from: http://link.springer.com/10.1007/s00127-016-1175-x

34. van Loo HM, Romeijn J-W, de Jonge P, Schoevers RA. Psychiatric comorbidity and causal disease models. Prev Med (Baltim) [Internet]. 2013 Dec [cited 2018 Mar 15];57(6):748–52. Available from: https://ac.els-cdn.com/S0091743512005439/1-s2.0-S0091743512005439-main.pdf?_tid=c560370c-53ef-4f70-bf1f-cf4ee0c5d57e&acdnat=1521082705_2c14e97da3bf2ee904deefe39102c985

35. Scott KM, Lim C, Al-Hamzawi A, Alonso J, Bruffaerts R, Caldas-de-Almeida JM, et al. Association of Mental Disorders With Subsequent Chronic Physical Conditions. JAMA Psychiatry [Internet]. 2016 Feb 1 [cited 2018 Mar 15];73(2):150. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5333921/pdf/nihms848687.pdf

36. Donisi V, Tedeschi F, Salazzari D, Amaddeo F. Pre- and post-discharge factors influencing early readmission to acute psychiatric wards: implications for quality-of-care indicators in psychiatry. Gen Hosp Psychiatry [Internet]. 2016 Mar [cited 2017 Jul 22];39:53–8. Available from: http://ac.els-cdn.com/S0163834315002352/1-s2.0-S0163834315002352-main.pdf?_tid=90e14686-6eaf-11e7-a1dd-00000aacb35d&acdnat=1500708778_9f5baa055654081e6a9809e6bf05b9b6

37. Hodgson RE, Lewis M, Boardman AP. Prediction of readmission to acute psychiatric units. Soc Psychiatry Psychiatr Epidemiol [Internet]. 2001 Aug 1 [cited 2018 Mar 15];36(6):304–9. Available from: http://link.springer.com/10.1007/s001270170049