Impact of Demographic Factors on the Treatment Response of Antidepressant Therapy: A Descriptive Cohort Study from Pakistan

Impact des facteurs démographiques sur la réponse au traitement antidépresseur: Une étude de cohorte descriptive du Pakistan

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ABSTRACT

Introduction: The study is conducted in Pakistan to evaluate the impact of socio-demographic factors that might influence the treatment response to antidepressants in depressive disorder. Moreover, this study brings data from a South Asian developing country, to compete the existing literature gap, where the response to antidepressant treatment with respect to demographic factors is mostly from the western countries.

Aim: A prospective, open-label, descriptive cohort study is designed to signify the association of demographic factors on the treatment response of antidepressants.

Methods: The patients presented to outpatient department (OPD) of Psychiatry clinic at Pakistan Railway Hospital, Rawalpindi from October 05, 2022 to July 31, 2023 were included in the study. All the patients were diagnosed by a Consultant Psychiatrist, according to ICD-11 and were prescribed an antidepressant therapy. The demographic factors were divided into sub-categories i.e. age, gender, marital status, income status, geographical location, education, and comorbid conditions. The change in depressive scores were measured by Patient Health Questionnaire 9 (PHQ-9) on day 0, and 28. The data was analyzed using SPSS and results are reported in the subsequent section.

Results: Out of 88 patients, depression was found most widespread among females, married individuals, illiterate, above 41 years of age with comorbid conditions. The response to treatment was better in males (49.84%), single individuals (49.24%), educated (43.70%), and senior citizens (46.19%) in terms of percentage improvement.

Conclusions: It was concluded that the response to treatment was different among different subcategories in terms of percentage improvement. Female, illiterate, and single/divorced/widowed populations showed poor response to treatment. Moreover, geriatric population response was better as compared to all other age group. The patients having different comorbid conditions are more prone to develop depression, but the response to antidepressant therapy was comparable to those without any systemic illness.

Key words: Antidepressants, depressive disorder, demographic factors, Patient Health Questionnaire-9.

RÉSUMÉ

Introduction: L'étude est menée au Pakistan pour évaluer l'impact des facteurs sociodémographiques susceptibles d'influencer la réponse au traitement aux antidépresseurs dans le trouble dépressif. De plus, cette étude apporte des données provenant d'un pays en développement d'Asie du Sud, pour combler le déficit de littérature existant, où la réponse au traitement antidépresseur en ce qui concerne les facteurs démographiques provient principalement des pays occidentaux.

Objectif: Une étude de cohorte prospective, ouverte et descriptive est conçue pour mettre en évidence l'association entre les facteurs démographiques et la réponse au traitement par antidépresseurs.

Méthodes: Les patients présentés au service ambulatoire (OPD) de la clinique de psychiatrie de l'hôpital ferroviaire du Pakistan, Rawalpindi du 5 octobre 2022 au 31 juillet 2023 ont été inclus dans l'étude. Tous les patients ont été diagnostiqués par un psychiatre consultant, selon la CIM-11 et se sont vu prescrire un traitement antidépresseur. Les facteurs démographiques ont été divisés en sous-catégories, à savoir l'âge, le sexe, l'état civil, le statut de revenu, la situation géographique, l'éducation et les comorbidités. L'évolution des scores de dépression a été mesurée par le questionnaire de santé du patient 9 (PHQ-9) aux jours 0 et 28. Les données ont été analysées par SPSS 27.0 et le test du chi carré a été appliqué pour les données catégorielles, tandis qu'une ANOVA unidirectionnelle a été utilisée pour les données quantitatives. des variables comme l'âge. La valeur p ≤ 0,05 était statistiquement significative.

Résultats: Sur 88 patients, la dépression était la plus répandue chez les femmes, les personnes mariées, analphabètes, âgées de plus de 41 ans et souffrant de comorbidités. La réponse au traitement était meilleure chez les hommes (49,84 %), les célibataires (49,24 %), les personnes instruites (43,70 %) et les personnes âgées (46,19 %) en termes de pourcentage d'amélioration.

Conclusions: Il a été conclu que la réponse au traitement était différente selon les différentes sous-catégories en termes de pourcentage d'amélioration. Les populations féminines, analphabètes et célibataires/divorcées/veuves ont montré une mauvaise réponse au traitement. De plus, la réponse de la population gériatrique était meilleure que celle de tous les autres groupes d'âge. Les patients présentant différentes comorbidités sont plus susceptibles de développer une dépression, mais la réponse au traitement antidépresseur était comparable à celle de ceux ne présentant aucune maladie systémique.

Mots clés: Antidépresseurs, trouble dépressif, facteurs démographiques, Questionnaire de santé du patient-9 (PHQ-9).

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INTRODUCTION

Depressive disorders are the most common among all psychiatric disorders. World Health Organization (WHO) statistics show that the 12-month period prevalence of depression is 6%, whereas its lifetime prevalence is 5-17% [1, 2]. Another report estimated by the Global Health Data Exchange (GHDx) in 2017, showed that 322 million people in the world are affected by depressive disorders [3]. The crude prevalence of depressive disorders in Pakistan is 13.65% [4].

The challenges to the management of depression mainly include the unavailability of mental health services [5], an incomplete course of treatment due to various reasons [2], and poor response to antidepressants [6]. In addition, giving augmentation with other medications to only 29% of patients is another potential problem [7]. The subsequent impact on the patient's emotional state, cognition, and behavior, results in a pervasive sense of sadness and a profound disinterest in once-daily enjoyable activities. The intensity of sorrow in depression is notably severe and debilitating, with the onset of suicidal thoughts as the gravest consequence [8].

The burden on the health system created by depression is destructive causing disruption across all the components and functions. Income status is one of the important factors for the development of depression, but in middle and low-income countries female gender, poor education, and lack of basic necessities of life add difficulties to in managing depression effectively and efficiently [9]. There has been extensive exploration within peer-reviewed literature related to the association between depression and specific socio-demographic factors [3], some of the literature from western population presents the demographic variable in response to antidepressant treatment [10]. The prevalence of demographic factors has been documented from the southern part of our region [11] but it is worth noting that there is no research that focuses on the subcategories of these factors in relation to the change of the depressive symptom scores in developing countries like Pakistan.

Considering the ultimate outcomes or complications of depression, there is an urgent need to identify the impact of subcategories for each demographic factor in developing country like Pakistan. So, this study was focused on assessing the magnitude of chief subcategories of demographic distribution that prognosticate the response to the treatment of depression. We performed a detailed group analysis in terms of the difference between the pre-treatment and post-treatment scores. This may help to mitigate the repercussions on mental health and will add to the data from lower-middle income countries. This will attempt to rectify the inherent potential of these observed sub-variables.

METHODS

Design

This open-label, prospective, descriptive cohort study was a part of a regional study conducted in a Pakistan Railway Hospital (PRH), Rawalpindi, between Oct 05, 2022, and July 31, 2023. This study was approved from the Institutional Review Board (IRB), Riphah International University, Rawalpindi, Pakistan. The sample size was calculated by "The Cochran Formula" [12].

Study participants

The patients with depressive disorders included in this study, were diagnosed by a consultant psychiatrist from an outdoor clinic, according to the latest classification of ICD-11. The inclusion criteria were (1) Patients diagnosed with depressive disorders with a PHQ-9 score of more than 9, (2) Patients aged 14 years and above, and (3) Only those accepting the informed consent.

Procedure

The data was anonymized w.r.t. the Helsinki Declaration of Research with Human Beings. The patients were recruited through the outdoor department and the follow-up was done both in the OPD and via telephone.

Instrument

The instrument used to measure depression was Urdu validation of PHQ-9 [13]. This is a 9-item questionnaire, with four response options and is a validated and reliable tool that is widely used for its known convenience, quickness to administer, and simplicity as shown in Appendix I and II [14]. Demographic factors taken into account for this study were age patterns, gender distribution, educational levels, comorbid conditions, and socio-economic conditions in terms of area distribution, monthly income, and occupation [3].

Statistical Analysis

Statistical Analysis was done by SPSS version 27.0. The mean and SD of each subcategory of demographic factor was calculated. The covariates, age, monthly income, educational level, smoking, and comorbid conditions were adjusted. The percentage improvement was calculated for each subcategory. PHQ-9 scores being numeric data, this was followed by either independent t-test or ANOVA for differences in PHQ-9 scores according to the number of subcategories of each factor.

RESULTS

Eighty-eight out of a hundred patients continued the treatment following subsequent follow-ups at PRH, Rawalpindi. There were 81.82% females and 18.18% males, which can be simplified to 4.5:1. In other words, for every 9 females, there were two male patients with depressive disorders at this medical facility. The frequency of depressive disorders was the most among married patients (71.59%), followed by single (21.59%) and those who are living separately from their partner, for one or the other reason (6.82%) as shown in Table 1.

Table 1. Demographic factors of the study participants

Demographic Factors	Subcategories	Frequency (n)	Percentage (%)
Gender	Female	72	81.8
	Male	16	18.2
Age	14-24	11	12.5
	25-40	28	31.8
	41-60	36	40.9
	61 plus	13	14.8
Marital status	Married	63	71.6
	Unmarried	19	21.6
	Divorced/widow	6	6.8
Educational Status	Illiterate	28	31.8
	Primary	8	9.1
	Secondary	12	13.6
	SCC/HSCC	21	23.9
	Graduation and above	19	21.6
Occupation	Student	5	5.7
	Housewife	55	62.5
	Laborer	3	3.4
	Staff	8	9.1
	Businessman	7	8.0
	Retired	2	2.3
	Other	8	9.1
Geographical Location	Urban	51	58.0
	Rural	37	42.0
Income status	Lower	74	84.1
	Lower-middle	13	14.8
	Upper-middle	1	1.1
Comorbid conditions	Absent	55	62.50
	Present	33	37.5

Age patterns of this study are shown in the bar chart, with class intervals categorized as youth (14-24yrs), young adult (25-40yrs), adult (41-60yrs), and senior population (61years+) [15]. Depression was most prevalent among the age group of 41-60 years i.e. 40.9%. Conversely, it was least among youth with a rate of 31.8% as shown in Table I. This study showed that most of the population presenting to Psychiatry OPD were not educated (31.82%). This was followed by intermediate education (23%), higher school education (22.71%), and professional education (21.59%). Housewives were the most affected group, showing a high rate of depressive disorders i.e. 62.5%. The patients belonging to rural and urban community were 57.9% and 42.05% respectively. Most of the patients (84%) presented to the outdoor department of the PRH, Rawalpindi belonged to the lower class with income less than Rs. 44,000/- (or USD 150/- approximately) per month as shown in Table 1.

The subcategories of demographic factors showing treatment response in terms of percentage improvement are shown in the Table 2.

DISCUSSION

Our study showed that depression was most prevalent among females (81.82%), married patients (71.6%), and those with low - income status (84.1%). These groups were significantly related to depression. Although, the frequency of depressive disorders was the most among married patients, but the separated/widowed/divorced patients had least response to the treatment (34.37%). Adults (40.9%) had more depression as compared to 39.2% among young patients. The treatment response to antidepressants among non-educated patients was the least i.e. 39.79% in terms of percentage improvement.

The existing literature shows that there is gender disparity, especially in terms of the prevalence and magnitude of treatment response to antidepressants [16]. Bains N, et al., mentioned that internationally, the female gender is more prone to have depressive disorder as compared to males, with a ratio of 2:1 [16]. Neitzke et al., revealed depression as the "illness of power" and this harsh reality has been elaborated in terms of factors including hormonal changes, and life circumstances [17]. The present study also supported this finding but it was found additionally that depression is climaxing sharply among the female population of Rawalpindi, Pakistan. On the other hand, depression should not be overlooked and underestimated in the male gender as well [18]. In addition, there was the difference in the mean depressive response to antidepressants among this subcategory, where males showed better treatment response as compared to females.

A bidirectional relationship exists between depression and marital status. A study conducted in Military Hospital Multan Cantonment, by Khokhar MM, found that in our region married population suffers from depression more as compared to other subgroups of this domain [19]. Though Liang Pan et al., mentioned that married patients might be at low risk as compared to divorced/separated/widowed/bachelors [20]. Our study showed that the patient flow to the out-door psychiatry department was more for married patients, as compared to ones not having any partner. Whereas the response to treatment was maximum in unmarried single individuals (49%), followed by 41% in married individuals. Poor response to treatment for treating the divorced/widow/separated depressed is considered a challenge. Bulloch AG, et al., conducted a study that also showed that marital status is further influenced by age and gender [21]. So, we may hypothesize that sharp increase in frequency of female gender may be the reason for this changing trend.

The relationship of age patterns to depressive disorders is unclear. Arias, et al., showed that depression is more prevalent above 45 years of age as compared to younger population i.e. below 29 years [22]. This present study showed same patterns, additionally the response to treatment was much better in senior citizens, followed by declining trends as we move towards younger population. This study suggested that antidepressant treatment response was less favorable in younger patients, while geriatric showed better outcomes.

Regarding educational status, this study showed high frequency but poor response to treatment among illiterate i.e. 39.79% as compared to other study subcategories. Notably, there was a discernible prevalence of depressive symptoms in the low and middle economics, which is further exacerbated by deteriorating economic conditions in our country.

Table 2. Subcategories of demographic factors.

Variables	Sub Categories	Total cases (n)	PHQ-9 scores on day 0	PHQ-9 scores at day 28	Percent improvement	p value
Gender	Females	72	16.77 ± 2.5	9.93 ± 4.8	40.80%	0.14
	Males	16	15.81 ± 3.08	7.93 ± 4.80	49.84%	
Age	14-24 years	11	16.45 ± 2.4	10.00 ± 5.9	39.21%	0.912
	25-40 years	28	16.32 ± 2.8	9.60 ± 4.7	41.18%	
	41-60 years	36	17.02 ± 2.7	9.72 ± 4.9	42.90%	
	61 plus	13	16.15 ± 2.3	8.69 ± 4.3	46.19%	
Marital status	Married	63	16.50 ± 2.6	9.71 ± 4.4	41.15%	0.289
	Single	19	16.47 ± 2.8	8.36 ± 6.0	49.24%	
	Divorced/Separated/ widow	6	18.00 ± 2.3	11.83 ± 4.4	34.27%	
Educational level	Illiterate	28	16.96 ± 2.4	10.21 ± 4.0	39.79%	0.759
	Primary	8	17.25 ± 2.3	10.00 + 3.9	42.02%	
	Secondary	12	16.66 + 3.3	9.33 + 4.7	43.99%	
	SCC/HSCC	21	15.81 + 2.8	8.38 + 6.0	46.89%	
	Graduation and above	19	16.63 + 2.6	9.89 + 5.2	40.52%	
Occupational trends	Housewives	55	16.70 + 2.6	9.54 + 4.6	42.87%	0.886
	Students	5	18.20 + 1.7	10.60 + 6.6	41.75%	
	Staff	8	16.37 + 2.7	10.25 + 5.4	37.38%	
	Laborer	3	16.66 ± 1.5	9.66 ± 1.5	42.01%	
	Businessmen	7	15.71 ± 2.4	7.85 ± 4.8	50.03%	
	Retired	2	16.50 ± 0.7	6.50 ± 0.7	60.60%	
	Others	8	15.87 ± 3.9	10.62 ± 6.3	33.08%	
Income	Lower	74	16.74 ± 2.6	9.67 ± 4.8	42.23%	0.875
	Lower-middle	13	15.76 ± 2.8	8.92 ± 5.3	43.52%	
	Upper-middle	1	17.00	10.00	-	
Geographical Location	Urban	51	16.72 ± 2.8	9.78 ± 5.2	41.50%	0.619
	Rural	37	16.43 ± 2.5	9.27 ± 4.4	43.57%	
Comorbid conditions	Present	55	16.78 ± 2.6	9.41 ± 4.6	43.92%	0.721
	Absent	33	16.30 ± 2.7	9.81 ± 5.3	39.81%	

Vigo DV, et al., conducted a study on a large scale to find the relationship of demographics with depression, and concluded that in the countries with low income status, the patients are less likely to get effective treatment coverage [3]. Hence, there was a need to conduct a comprehensive analysis of socio-demographic data related to depression and these demographic subcategories may be explored further.

Our study showed that housewives, a unique occupation [23], were the most affected group i.e. 62.5%. This is a strikingly higher trend as compared to other occupations. It is associated with the culture of our country. A study conducted in Lady Aitcheson hospital, Lahore, showed that whether it's mild, moderate, or severe depression, the highest rates were among housewives [24]. Our study found that that housewives, students, staff, and laborer showed comparable improvement, versus drastic improvements among retired population. So in future, we have to ensure appropriate treatment strategies, which are accessible to various occupations with different socio-economic backgrounds. Lastly, our study had shown more inflow of patients with lower class, urban population and in patients with some comorbid condition either diabetes mellitus, hypertension, hepatitis, asthma etc. Study conducted earlier showed that the severity of depression is more in patients diagnosed with Hepatitis C as compared to controls before start of interferon therapy, the response rate to treatment was not analyzed after interferon therapy [25]. Moreover, we found that the response rate was comparable among other subcategories different comorbid conditions.

Limitations and recommendations

The research study was single centered study which can be extended to a larger scale with community-based population. Covariate regression was not utilized in our analysis because when we divided the demographics into subcategories, the size of each subcategory became too small to yield meaningful results for regression analysis. The response rate in terms of the percentage improvement showed that there exists an exigent necessity to plan the decisive strategies for different subcategories of demographic factors related to depression, and to meticulously consider the multifaceted risks and mitigating the factors intertwined with depression.

CONCLUSION

It was concluded that the response to treatment was different among different subcategories in terms of percentage improvement. Female, illiterate and single/divorced/widowed population showed poor response to treatment. Moreover, geriatric population response was better as compared to all other age group. The patients having different comorbid conditions are more prone to

develop depression, but the response to antidepressant therapy was comparable to those without any systemic illness.

NAME: _____   DATE: _____

Over the last *2 weeks*, how often have you been bothered by any of the following problems?
(use "✓" to indicate your answer)

	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself—or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed. Or the opposite — being so figety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead, or of hurting yourself	0	1	2	3
add columns		+	+	

(Healthcare professional: For interpretation of TOTAL, please refer to accompanying scoring card.)   TOTAL: _____

10. If you checked off *any problems*, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all _____
Somewhat difficult _____
Very difficult _____
Extremely difficult _____

Appendix 1. Patient Health Questionnaire-9 (PHQ-9)

سوالنامہ

Date: _____

(تقریباً روزانہ)	(کئی دن)(لیکن ایک ہفتے سے زیادہ)	(ایک ہفتے سے زیادہ)	(بالکل نہیں)	گزرشتہ ہفتوں کے دوران مندرجہ ذیل مسائل سے آپ کتنا پریشان ہوئے؟
				۱۔ روزمرہ کے کاموں میں دلچسپی اورلطف کی کمی۔
				۲۔ اداسی،افسردگی یا مایوسی کا احساس
				۳۔ (الف) نیند کا نہ آنا۔ (ب) نیند آنے کے بعد سوتے رہنے میں دشواری۔(ج) نیند کی زیادتی۔
				۴۔ بے سبب تھکاوٹ یا کمزوری کا احساس
				۵۔ بھلا پھوک میں کمی یا زیادتی۔
				۶۔ (الف) شکست خوردگی یا ناکامی کا احساس (ب) اپنے خاندان کی توقعات پورا نہ اترنے کا احساس
				۷۔ توجہ مرکوز کرنے میں دشواری پیش آنا جیسے اخبار پڑھنے یا ٹی وی دیکھنے میں۔
				۸۔ آتی سست روی سے چلنا یا بولنا کہ دوسروں نے اس بات کا نشان دہی کی ہو۔یا اس کے برعکس معمول کی بے چینی سے ہوئی بے چینی اضطراب۔
				۹۔ (الف) ذہن میں اس بات کا بار بار آنا کہ زندگی سے موت بہتر ہے۔
				(ب) ذہن میں اپنی ذات کو نقصان پہنچانے (ضرر رسانی) کے خیالات کا آنا۔

نوٹ:
اگر آپ نے کسی مسئلے کو درست کا نشان لگایا ہے تو یہ بتائیے ان مسائل کی وجہ سے آپ کو کام کرنے اپنے گھر کا خیال رکھنے اور دوسروں کے ساتھ ملنے جلنے میں کتنی مشکل پیش آئی۔

(بالکل نہیں)   (کچھ مشکل)   (بہت مشکل)   (شدید مشکل)

Appendix 2. Urdu Validation of PHQ-9

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