Research Article

A case control study: sociodemographic variant for mental illness

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Abstract

Background: Psychiatric disorders are common in the community. The need of the hour is to develop epidemiological databases (registries) of adequate sample sizes with better funding and coordination, utilizing culture-specific study instruments, which would aid in delineating the etiology and management of mental disorders. With this in mind and to bridge the gap, a case control study has been performed to find out various epidemiological variants of mental illness among the people of Ahmedabad city.

Objective: To study associated risk factors in patients with mental illness and in normal persons, that is, controls and to find odds ratio (OR) for comparison of various risk factors in cases (mentally ill) and controls (normal person not mentally ill).

Materials and Methods: Adults aged 18–65 years having mental illness were considered as cases and those who were not having the mental illness were considered as controls. The cases were coming to attend the Psychiatric Out-Patient Department of Civil Hospital Ahmedabad (CHA). They belong to various parts of Ahmedabad District and neighborhood community of CHA. The controls were from the neighborhood community of CHA. Study was conducted from March 2012 to April 2013.

Result: OR was estimated to be 1, which signifies that difference in gender does not increase the risk for mental illness. Mean age in cases was found to be 35.49 (11.92) years. A total of 125 cases (75.75%) and 140 controls (84.84%) were Hindus followed by 36 cases (21.81%) and 23 controls (13.93%) of Muslims. It was observed that unemployment increases the risk for mental illness by nearly 16 times (OR = 16.15).

Conclusion: The results clearly indicate that mental illness is multifactorial in origin and by just studying a single cause is not enough for its prevention or cure. The need of the hour is to study the whole network of mental illness causation so that better cure and prevention could be planned.

KEY WORDS: Case control, mental illness, sociodemography

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Introduction

Psychiatric disorders are common in the community. At present, the overall psychiatric morbidity in Gujarat indicates that as many as 2.8 million[3] of adult population at any given time are likely to be suffering from mental disorders.

The causes of mental illness are complex, varied, differing from condition to condition, and influenced by several socio-demographic and biological attributes. The need of the hour

is to develop epidemiological databases (registries) of adequate sample sizes with better funding and coordination, utilizing culture-specific study instruments, which would aid in delineating the etiology and management of mental disorders. To take a closer look at the association of issues such as poverty, urbanization, and changing life patterns with mental health is also one of the aims.

With this in mind and to bridge the gap, a case control study has been performed to find out various epidemiological variants of mental illness among the people of Ahmedabad City. The aims and objectives of the study are to study the associated risk factors in patients with mental illness and normal persons, that is, controls; to find odds ratio (OR) for comparison of various risk factors in cases (mentally ill) and controls (normal person not mentally ill); and to find logistic regression and adjustable OR to find the association of the various risk factors.

Materials and Methods

Adults aged 18 to 65 years having mental illness were considered as cases and those who were not having any mental illness were considered as controls. Study was conducted from March 2012 to April 2013.

Variables Studied

The suspected "causes" that were studied for the association with the mental illnesses were age, sex, socioeconomic status (SES), and so on.

Case Definition

Any person, in the age group of 18 to 65 years, coming to the psychiatric OPD of civil hospital for the first time during March 2012 to April 2013 and diagnosed by the consulting psychiatrist for mental illness constitutes the case of our study.

Control Definition

Any person not suffering from any mental illness in the age group of 18 to 65 years, residing in the neighborhood community of Civil Hospital Ahmedabad (CHA) constitutes the control of our study.

Sample size

A matched case control study was conducted in 330 adults (165 cases and 165 controls) in the age group of 18 to 65 years and residing in the neighborhood community of Ahmedabad City or coming to attend the OPD of CHA.

Number of Controls per Case

One control per case was studied.

Method of Sampling

By simple random sampling using chit method, all the cases and controls who meet the inclusion criteria were selected and surveyed. The study was conducted till the completion of sample size.

Statistical Analysis

Analysis was done in Epi Info version 3.4, GraphPad, and SPSS softwares. OR, adjusted OR by logistic regression method, Z test, and Chi-square (χ^2) test were used to test the statistical significance and causal relationship. Exposure rates were also calculated.

Ethical Clearance

Verbal consent was taken from the cases as well as controls. Permission was obtained from the department of psychiatry for conducting the study and there were no ethical issues or conflicts of opinion present.

Result

Table 1 shows that there is an equal distribution of men and women among cases and control. This was done so as to maintain the matching between the two groups. There were 86 men (52.12%) and 79 women (47.88%) both in cases and controls. Ratio of men/women is 1.08:1. There is no statistical difference between male and female distribution among cases and controls ($p > 0.05$). OR was estimated to be 1, which signifies that difference in gender does not increase the risk for mental illness even if it was found to be statistically insignificant.

Table 2 shows the most common age group was found to be middle age group, that is, in the age group 25–45 years, 106 cases (62.24%) and 117 controls (70.90%) were present, followed by the age group 18–24 years, in which 35 cases (21.21%) and 30 controls (18.18%) were present. Mean age in cases was found to be 35.49 with standard deviation of ±11.92 years. It was found that there is no statistical significant difference among the age-wise distribution in cases and controls ($p > 0.05$). OR between the age group 24 to 45 years and 18 to 24 years and even between the age group 24 to 45 years and 46 to 65 years was also not significant ($p > 0.05$).

Table 3 shows that 125 cases (75.75%) and 140 controls (84.84%) were Hindus followed by 36 cases (21.81%) and 23 controls (13.93%) of Muslims, whereas only 4 cases and 2 controls were Christians/Parsis, and so on. As $p > 0.05$ at 95% confidence interval, there is no statistical significant difference among the values observed in religion-wise distribution in cases and controls ($p > 0.05$).

It is clear from Table 4 that nearly 121 cases (73.33%) were unemployed whereas unemployment is just 14.54% among the controls. Most common job among the cases was government job 27 (16.36%), whereas among the controls most of them were laborers 98 (59.39%). It was found that the distribution among the cases and controls was statistically highly significant ($p > 0.05$), this implies that difference in job can pose mental illness. The exposure rate for unemployment among the cases and controls was 73.33% and 14.54%, respectively. It was observed that the unemployment increases the risk for mental illness by nearly 16 times (OR = 16.15) and this observation was even statistically highly significant as $p < 0.0001$.

Table 5 shows that most of the cases of total study groups were educated from 8th to 10th standard, among the cases nearly 45 (27.27%) were educated from 8th to 10th standard, followed by 36 (21.81%) from 1st to 7th standard. Only 28 (16.96%) of cases were illiterate. Among the controls, most of them (25.45%) were 11th to 12th standard pass followed by 1st to 7th standard (18.18%). Nearly 12.12% of controls were illiterate. This distribution of educational qualification among the cases and controls was found to be statistically highly significant. Exposure rate of being illiterate in cases was 16.96% and exposure rate in controls was12.12%. Illiteracy increases the risk of mental illness by 1.48 times but this association was not statistically significant ($p > 0.05$).

Table 6 shows that most of the cases and controls of the total studied groups were unmarried 179 (54.24%). Among them 87 (52.72 %) were from the cases group whereas 92 (55.75%) were from the controls group. A total of 31.51% of cases and 25.45% of controls were married. Only 26 cases (16.01%) and 31 controls (18.6%) were living alone as they were either widowed or divorced. Exposure rate of loneliness in cases was 31.51% whereas exposure rate in controls was 25.45%. This difference among the cases and controls was found owing to chance, that is, statistically it was not significant. On analyzing for marital status between the married and single (unmarried/divorce/widow), it was found that that the marriage increases the risk of mental illness by just 1.3 times, which was found to be statistically insignificant ($p > 0.05$) (OR = 1.34).

Table 7 shows that the most common SES was found to be class IV with the value of 130 (39.39%), that is, 66 cases (40.00%) and 64 controls (38.78%) belonged to class IV whereas among the cases, least common was class I with the value of 13 (7.87%). In the control group, least common class was class II with the value of 10 (6.06%). On statistical analysis, this difference of distribution was found to be highly significant ($p < 0.05$). Exposure rate of low SES in cases was 32.12% and in controls was 44.24%. On studying OR for SES of cases and controls, it was found that lower SES poses 40% more risk for development of mental illness as compared with upper class. The difference among the distribution of the cases and controls was found to be statistically significant ($p < 0.05$).

Table 8 shows the relation between the poverty line and the presence or absence of mental illness. It was observed that 61 cases (36.96%) and 28 controls (16.96%) were in the below poverty level (BPL) group. On comparing above poverty level (APL) with BPL in cases, it was found that 104 (63.03%) were APL whereas 61 (36.96%) were BPL. Same distribution was maintained in the controls with APL 137 (83.03%) and BPL 28 (16.96%).

The exposure rate of poverty in cases was 63.03% and in controls was 83.03%. On further analysis, it was revealed that the risk of developing mental illness among the BPL is increased by 2.8 times and it was found that this difference among the distribution was statistically highly significant ($p < 0.05$).

Table 9 shows the descending order of adjusted OR of various risk factors for mental illness. On analysis for risk of mental illness, it was found that unemployment, illiteracy, and marital status posed to be significantly associated with the risk of developing mental illness.

Discussion

Matching in gender distribution was done 86 males and 79 females (each in cases and controls) were recognized to be included in the study. A total of 52.12% men and 47.88% women were suffering from mental illness, which signifies prevalence of mental illness is more in men as compared with the women. This observation is contrary to the one which shows that women were more vulnerable to mental health–related problems as compared with men. Some 57% of the patients in the last 9 years have been women.[1,4] This difference might be owing to the fact that women have less access to mental hospital as compared with men.[7] The mood swings related to hormonal changes as a part of the menstrual cycle and childbirth can account for higher prevalence of anxiety and depression disorders in women.

The results reported here in Table 2 show clearly that first onset of mental disorders usually occurred in the adult age group. It was found that 62.24% of adults were suffering from mental illness and as compared with adult; adolescents had 1.28 times increased risk of disease. This risk was found to be 1.47 times in case of elderly population. In another prevalence study of age group, it was found that the first onset of mental disorders usually occurs in the childhood or adolescence.[5] Depressive disorders among the elderly people go unnoticed even more often than among the young adults because often they are incorrectly considered the part of ageing process.[8] No study was found, which could estimate the OR of age with risk of mental illness but in this study OR is 1.28 to 1.47.

On studying the religion in Table 3 with respect to risk of mental illness in this study, it was found that if Hindus were taken as reference then the risk of mental illness in other communities, such as Muslim, Sikh, Christian, Parsis, and so on, was not significant (OR 0.44 to 0.57). The reason might be that as India has maximum Hindus followed by Muslims followed by other communities; this variation might be just a biological variation in the study.[9,10]

Poverty and related conditions of unemployment or low SES, low education status or illiteracy, deprivation, and homelessness are not only widespread in poor countries, but also affect a number of rich countries. Data from cross-national surveys in Brazil, Chile, India, and Zimbabwe show that common mental disorders were twice as frequent among the poor as among the rich.[2,6] Similar results had been reported from recent studies carried out in North America, Latin America, and Europe.[6] There is also evidence that the course of this disorder is also determined by the SES of a person. These results were well compared with this study where it was found that unemployment increased the risk of mental illness by 16.15 times, illiteracy was found to increase the risk by 1.5 times, socioeconomic difference as per Kuppuswamy was found to increase the risk by 60% and as per calorie

Table 1: Male–female distribution among cases and control

Male–female distribution	Cases	Controls	Odds ratio	95 % CI	*Z* statistic
Male	86 (52.12%)	86 (52.12%)			
Female	79 (47.88%)	79 (47.88%)	1.000	0.64–1.54	0.000
Total	165 (100%)	165 (100%)			$p = 1.0000$

CI, confidence interval.
$\chi^2 = 0$; df = 1; $p = 1$.

Table 2: Age-wise distribution among cases and controls

Age group in years	Cases	Controls	Odds ratio	95 % CI	*Z* statistic
18–24	35 (21.21%)	30 (18.18%)	1.28	0.74–2.24	0.895
					$p = 0.37$
25–45	106 (62.24%)	117 (70.90%)	Reference		
46–65	24 (16.55%)	18 (10.92%)	1.47	0.75–2.86	1.13
					$p = 0.25$
Total	165 (100%)	165 (100%)	Mean age = 35.48 ± 11.92		

CI, confidence interval.
$\chi^2 = 1.784$; df = 2; $p = 0.40$.

Table 3: Religion-wise distribution of cases and controls

Religion	Cases	Controls	Odds ratio	95 % CI	*Z* statistic
Hindu	125 (75.75%)	140 (84.84%)	Reference		
Muslim	36 (21.81%)	23 (13.93%)	0.57	0.32–1.01	1.9
					$p = 0.05$
Parsi/Christian, etc.	4 (2.42%)	2 (1.21%)	0.44	0.08–2.47	0.92
					$p = 0.35$
Total	165 (100%)	165 (100%)	0.5580	0.32–0.97	$p < 0.05$

CI, confidence interval.
$\chi^2 = 3.347$; df = 2; $p = 0.187$.

Table 4: Occupational distribution of cases and controls

Occupation	Cases	Controls	Odds ratio	95% CI	*Z* statistic
Unemployed	121 (73.33%)	24 (14.54%)	Reference		
Laborer	13 (7.87%)	98 (59.39%)	38.006	18.39–78.52	9.86
					$p < 0.0001$
Private job/business	4 (2.42%)	23 (13.93%)	28.98	9.19–91.42	5.74
					$p < 0.0001$
Government job	27 (16.36%)	20 (12.12%)	3.74	1.80–7.71	3.56
					$p = 0.0004$
Total	165 (100%)	165 (100%)	Odds ratio (unemployment/ employment) = 16.15; $p < 0.0001$		

CI, confidence interval.
$\chi^2 = 144.393$; df = 3; $p = 0.00001$.

distribution, risk increased was nearly three times in this study [Tables 4, 5, 7, and 8].

In this study, being married increases the risk of mental illness by 1.34 times as compared with being single (divorce/ unmarried/single). This risk was maximum in divorced as compared with other two. In this study, it was observed that 17% came to discuss their marital issues[6] [Table 6].

Conclusion

The results clearly indicate that mental illness is multi-factorial in origin and by just studying a single cause is not enough for its prevention or cure. The need of the hour is to study the whole network of its causation so that better cure and prevention could be planned.

Table 5: Educational distribution of cases and controls

Education	Cases	Controls	Odds ratio	95 % CI	*Z* statistic
Illiterate	28 (16.96%)	20 (12.12%)	Reference		
1–7 (Primary)	36 (21.81%)	30 (18.18%)	1.16	0.55–2.47	0.40 $p = 0.68$
8–10 (Secondary)	45 (27.27%)	28 (16.96%)	0.87	0.41–1.83	0.36 $p = 0.71$
11–12 (Higher secondary)	17 (10.30%)	42 (25.45%)	3.45	1.54–7.7	3.02 $p = 0.002$
Graduate	26 (15.75%)	25 (15.15%)	1.34	0.60–2.97	0.73 $p = 0.46$
Post graduate	13 (7.87%)	20 (12.12%)	2.15	0.87–5.31	1.66 $p = 0.09$
Total	165 (100%)	165 (100%)	Odds ratio (illiterate/literate) = 1.48; $p = 0.213$		

CI, confidence interval.
$\chi^2 = 17.935$; df = 5; $p = 0.003$.

Table 6: Marital status of cases and controls

Marital status	Cases	Controls	Odds ratio	95 % CI	*Z* statistic
Married	52 (31.51%)	42 (25.45%)	Reference		
Unmarried	87 (52.72%)	92 (55.75%)	1.30	0.79–2.16	1.05 $p = 0.29$
Divorced	21 (12.72%)	28 (16.96%)	1.65	0.82–3.31	1.41 $p = 0.15$
Widow	5 (3.03%)	3 (1.81%)	0.742	0.16–3.28	0.39 $p = 0.69$
Total	165 (100%)	165 (100%)	Odds ratio (married/single) = 1.34; $p = 0.223$		

CI, confidence interval.
$\chi^2 = 2.703$; df = 3; $p = 0.439$.

Table 7: SES distribution between cases and controls (as per Kuppuswamy classification for SES)

SES	Cases	Controls	Odds ratio	95 % CI	*Z* statistic
Class I	13 (7.87%)	25 (15.15%)	1.26	0.54–2.92	0.54 $p = 0.58$
Class II	15 (9.09%)	10 (6.06%)	0.43	0.17–1.12	1.70 $p = 0.08$
Class III	25 (15.15%)	38 (23.03%)	Reference		
Class IV	66 (40.00%)	64 (38.78%)	0.63	0.34–1.17	1.44 $p = 0.14$
Class V	46 (27.87%)	28 (16.96%)	0.40	0.20–0.79	2.60 $p = 0.009$
Total	165 (100%)	165 (100%)	Odds ratio (SES I–III/IV–V) = 0.596; $p = 0.02$		

CI, confidence interval; SES, socioeconomic status.
$\chi^2 = 11.881$; df = 4; $p = 0.018$.

Table 8: Distribution of cases and controls as per poverty line (as per calorie distribution)

Poverty line	Cases	Controls	Odds ratio	95 % CI	*Z* statistic
BPL (below poverty line)	61 (36.96%)	28 (16.96%)	2.869	1.71–4.80	4.013 $p = 0.0001$
APL (above poverty line)	104 (63.03%)	137 (83.03%)			
Total	165 (100%)	165 (100%)			

CI, confidence interval.
$\chi^2 = 16.75$; df = 1; $p = 0.00004$.

Table 9: Adjusted odds ratio of factors associated with mental illness

S. no	Characteristics	Category	Number	Odds ratio	Adjusted OR
1	Employment	Unemployed	121	16.1563* (9.28–28.10)	14.3421 (8.87–29.13)*
		Employed	44		
2	Marital status	Married	52	1.3477 (0.83–2.17)	2.80 (0.78–6.81)*
		Single	113		
3	Education	Illiterate	28	1.4818* (0.79–2.75)	2.4326 (0.62–2.5)*
		Literate	137		
4	Socioeconomic status (calorie)	BPL	61	0.3485* (0.20–0.58)	0.87 (0.20–0.79)
		APL	104		
5	Socioeconomic status (Kuppuswamy)	1–3	53	0.5964* (0.38–0.93)	0.73 (0.21–2.54)
		4–5	112		
6	Religion	Hindu	125	0.5580* (0.32–0.97)	0.6754 (0.31–0.84)
		Non-Hindu	40		

APL, above poverty line; BPL, below poverty line; OR, odds ratio.
*Statistically significant ($p < 0.05$).

In the Indian context and as found out in this study, some priority issues are placed herewith for planning, implementation, and evaluation of the mental health-care delivery system and they are as follows:

1. Improvement in literacy
2. Improvement in family care
3. Improvement in SES
4. At-risk approach
5. BCC activities for adverse cultural factors
6. Health education on early diagnosis of signs and symptoms, available facilities and management

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