Research Article

A cross-sectional study on depression from rural India

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ABSTRACT

Background: Depression has been recorded since antiquity. It is an illness that affects both the mind and the body and is a leading cause of disability, workplace absenteeism, decreased productivity and high suicide rates. The present study was conducted in the rural field practice areas of Department of Community Medicine, Jawaharlal Nehru Medical College, Aligarh, Uttar Pradesh. The purpose of this study was to determine the prevalence and severity of depression in the study population and to assess the knowledge regarding causes of depression.
Methods: 360 adult respondents were chosen using systematic random sampling to participate in the study. Face to face interviews were then conducted using a semi-structured proforma for collecting the data for socio-demographic and other factors. Depression in the subjects was assessed using the structured and pre-validated Patient Health Questionnaire-9 (PHQ-9).
Results: The overall prevalence of depression was 11.9%. Majority of the subjects had moderate grades of depression. But knowledge regarding the causes of depression still comprised of certain supernatural causes.
Conclusions: Rates of depression were quite comparable with the other studies. Depression was twice more in females. Apart from increasing mental health services and integrating this with general health services in our community there is also a dire need to focus on greater Information, Education and Communication activities regarding awareness of causes of depression and its prevention.

Keywords: Adult, Depression, India, Knowledge, Prevalence, Risk factors

INTRODUCTION

Depression is one of the most widespread illness that can affect anyone, anytime and anywhere. It is the commonest mental illness that often coexist with other serious illnesses.[1-3] Depression has been recorded since antiquity and experience of depression has plagued humans since the earliest documentation of human experience. Hippocrates (460 to 357) before the common era (BCE) used the term melancholia (black bile) as a state of aversion to food, despondency sleepiness, irritability, and restlessness. The first English text entirely devoted to such illness was Robert Burton's Anatomy of Melancholy, published in 1621.[4] Depression is prolonged and persistent mood which can colour and interfere with many aspects of one's life. It is an illness that affects both the mind and the body and is a leading cause of disability, workplace absenteeism, decreased productivity and high suicide rates. Unlike other illnesses or disorders, there is no simple explanation as to what causes depression. Today it is also considered as a significant contributor to the global burden of disease and affects people in all communities across the world. The World Mental Health Survey conducted in 17 countries found that on average about 1 in 20 people reported having an episode of depression in the previous year.[5] Depression may affect

people at very young age, reduces the functional capacities and recur continuously, in this regards it is also significantly causing disability around the globe in terms of total years lost due to disability. In terms of type of life events, it is seen that depressed patients experience significantly higher proportion of life events related to death of a family member, personal health related events, bereavement, interpersonal and social events. Today for all these reasons the demand for curbing depression and other mental health conditions is on the rise. The aim of the study was to determine the prevalence and grades of severity of depression and to assess the knowledge regarding the causes in the study population.

METHODS

The current study was a Community based Cross sectional study conducted in the field practice areas of Rural Health Training Centre (RHTC), Department of Community Medicine, Jawaharlal Nehru Medical College, Aligarh Muslim University, Aligarh, Uttar Pradesh, India. The study period was 6 months, from July 2012 to Dec 2013.

Inclusion and exclusion criteria

Adult subjects (≥19 years) in the registered areas under R.H.T.C. and U.H.T.C and all individual who gave consent were included in the study whereas the exclusion criteria constituted of adults (≥19 years) who do not give consent to participate, moribund and severely ill individuals, individuals who are deaf or dumb, household found to be locked, or eligible subjects not present.

Study tools

A pre-designed, semi structured proforma was used for data collection. Part I of the proforma consisted of baseline personal information and data on socio-demographic and other determinants of depression. Part II consisted of a pre-tested, pre-validated, structured and globally recognised tool, PHQ-9. For the study the Hindi version of the Patient health questionnaire-9 was used.

The Hindi version has also been pretested and pre-validated against DSM-IV diagnosis of depression made by psychiatrists in India, and has shown a Kappa Coefficient of 0.917.The sensitivity and specificity of the hindi version is found to be 0.995 and 0.905 respectively and the overall accuracy is 0.9753.[6] Part III delt with the questions for assessment of knowledge regarding causes of depression. These questions were adapted from previous published studies.[7-8] The answers to these questions were recorded as Yes, No or Do not know.

Ethical issues

A prior permission for conducting the study was taken from the Institutional Ethics Committee of the Jawaharlal Nehru Medical College, Aligarh Muslim University.

Informed consent was taken from each subject before interview. The nature and purpose of the study were explained to them. Confidentiality was assured. Interviews were conducted in a non-hostile and non-judgmental manner. Local cultural values and ideas were respected.

Sample size

Most of the published community based studies were done in South India. Studies done in North India or around Aligarh District were either based on elderly population or were very old. So it was decided to conduct a pilot study to obtain an estimated prevalence for calculating the sample.[9-10] Considering the general rule of thumb of taking 30 subjects or greater to estimate a parameter, a pilot study was conducted on 100 individuals, out of which 8 were diagnosed to be having depression.[11] Therefore an estimated prevalence of 8.0% was obtained. Sample size based on the above mentioned pilot prevalence with an allowable error of 3% and including 10% non-response was obtained to be 360.

Sampling

After randomly selecting 1st household every 'k'th (k= sampling interval) house was selected by systematic random sampling. In each household one adult of ≥19 years of age was selected. If the household had more than one adult then the selection of study subjects was done by simple random sampling by lottery method. If the sampled household had no adult then the adjacent (immediate next) household was taken for study.

Statistical analysis

Data entry and analysis was done was done through SPSS-20 software. Chi square test to test the significance of difference between proportions was used and One Way ANOVA Analysis of variance was used for testing the difference between the grades of severity of depression scores among and within various groups.

RESULTS

Socio-demographic description of the study population

The current study reported that overall out of 360, 202 (56.1%) of the respondents were females as compared to 158 (43.9%) males. Maximum number of respondents (24.4%) belong to the age 45-59 years age group. The study population constituted of both muslims and hindus (65.8% hindus VS 34.2% muslims).

This distribution according to the religion was found to be statistically significant (p=0.014). 86.1% were married, 7.2% were widowed while only 0.3% wee either divorced or separated. Majority of the study subjects were illiterate and 176 out of 360 (38.1%) study subjects had low standard of living index (Table 1).

Prevalence of depression

Table 2 shows the prevalence of depression in the study area with respect to various socio-demographic and other factors. The overall prevalence of depression in the present study was found to be 11.9% (43 out of 360). The current study reported a maximum prevalence of 27.1% in the elderly age group whereas a minimum prevalence of 3.0% in the 19-29 years age group and this difference was found to be statistically significant ($p \leq 0.001$). The rates of depression were found to be twice as high in females as compared to males (15.3% vs 7.6%). Comparing the marital status depression was far more prevalent in widows (53.8%) as compared to married subjects (9.4%) and this result was also found to be significant ($p \leq 0.001$). In the current study highest (14.2%) rates of depression were found to be present in illiterate subjects than those having some education. 16.1% of the study subjects having a low SLI were found to be suffering from depression as compared to 12.1% of those having high SLI (p=0.092). Among the occupational groups depression was found to be present in 33.3% of the professional groups, followed by 11.5% in the housewives. Higher rates of depression (14.1%) were found in the subjects living in overcrowded dwellings as compared to those where overcrowding was absent (p=0.005). Among the other factors including various life events depression was found to be more in-subjects with early parental loss (17.4%), subjects with

appositive family history of mental disorders (37.5%), study subjects with a chronic illnesss (28.1%), subjects with disability (42.9%) and 17.1% in subjects having substance dependence. These results of the current study were found to be statistically significant.

Severity of Depression

The current study also commented upon the grades of severity of depression in the study subjects. The distribution of depression severity is described according to sex in the study population in Figure 1. It illustrates that overall higher number of females were found to be suffering from severe grades of depression as compared to males in the current study. 72.7% of females had mild grades of depression compared to only 27.3% of males, whereas 61.5% females had moderate grades of depression while only 38.5% males suffered with moderate depression. The study also concluded that all (100.0%) the subjects that had severe grades of depression were also females and that majority of the subjects with very severe grades of depression were also females (66.7%). On applying the One-Way ANOVA (Analysis Of Variance) for severity of depression by PHQ-9 Scores with relation to sex of the study subjects (Tables 3(a) and 3(b)), it was concluded that this difference between the males and females in the grades of severity of depression was found to be statistically significant (F=4.326, p=0.040).

Table 1: Socio-demographic profile of the study subjects.

Socio-demographic factor	Category	Males (n=158)	Females (n=202)	Total N (%) N= 360	Significance
Religion	Hindu	115(72.8)	122(60.4)	237(65.8)	$\chi2^=$ 0.056 p = 0.813
	Muslim	43(27.2)	80(39.6)	123(34.2)	
Age group	19-29	23(14.8)	43(21.3)	66(18.3)	$X^{2=}$ 3.387 P = 0 .336
	30-44	64(40.5)	83(41.1)	47(13.1)	
	45-59	43(27.2)	45(22.3)	88(24.4)	
	60 and above	28(17.7)	31(15.3)	59(16.4)	
Marital status	Married	139(88.0)	171(84.7)	310(86.1)	$\chi2^=$ 21.382 p = < 0.001
	Unmarried	16(10.1)	7(3.5)	23(6.4)	
	Divorced/Separated	1(0.61)	0(0.0)	1(0.3)	
	Widowed	02(1.3)	24(11.9)	26(7.2)	
Educational status	Illiterate	51(32.3)	125(61.9)	176(48.9)	$X^{2=}$ 39.692 P=<0.001
	Primary	16(10.1)	22(10.9)	38(10.6)	
	Junior/High School	57(36.1)	36(17.8)	93(25.8)	
	Intermediate and above	34(21.5)	19(9.4)	53(14.7)	
Sli	Low	62(39.2)	75(37.1)	137(38.1)	$\chi2^=$ 0.574 p = 0.750
	Medium	60(38.0)	74(36.6)	134(37.2)	
	High	36(22.8)	53(21.2)	89(24.7)	
Occupational status	Unemployed/ Retired	30(19.0)	28(13.9)	58 (16.1)	X2 = 220.40 P= <0.001
	Unskilled/ Semiskilled	58(36.7)	06(3.0)	64 (17.8)	
	Skilled	14(8.9)	01(0.5)	15(4.2)	
	Clerical/Shop/ Farm	51(32.3)	07(3.5)	58(16.1)	
	Professional	05(3.2)	07(3.5)	12(3.3)	
	Homemaker	00(0.0)	153(75.7)	153(42.5)	

Table 2: Prevalence of depression in relation to certain socio-demographic and other 2011characteristics of the study subjects.

Socio-demographic factor	Categories	Depression		Significance
		Present (n=43)	Absent (n=317)	
Age-groups	30-44years (n=147)	14 (9.5)	133 (90.5)	$\chi2^=$ 11.10
	45-59 years (n=88)	11 (12.5)	77 (87.5)	p = 0.004
	>60 years (n=59)	16 (27.1)	43 (72.9)	
Sex	Male (n=158)	12 (7.6)	146 (92.4)	$\chi2^=$ 5.065
	Female (n=202)	31(15.3)	171 (84.7)	p = 0.024
Religion	Hindu (n= 237)	29 (12.2)	208 (87.8)	$\chi2^=$ 0.056
	Islam (n=123)	14 (11.4)	109 (88.6)	p = 0.813
Marital status	Married (n= 310)	29 (9.4)	281 (90.6)	
	Unmarried(n= 23)	0 (0.0)	23 (100.0)	
	Divorced/ (n= 01) Separated	0 (0.0)	1 (100.0)	$\chi2^=$ 48.865 P = <0.001
	Widowed (n= 26)	12 (53.8)	14 (46.2)	
Education	Illiterate (n= 176)	25 (14.2)	151 (85.8)	
	Primary (n= 38)	03 (7.9)	35 (92.1)	
	Junior / high school (n= 93)	10 (10.8)	83 (89.2)	$\chi2^=$ 2.028 P = 0.917
	Intermediate/ (n= 43) Above	04 (9.3)	39 (90.7)	
Sli	Low (n= 137)	22 (16.1)	115 (83.9)	
	Medium (n= 134)	10 (7.5)	124 (92.5)	$\chi2^=$ 4.778
	High (n= 89)	11 (12.4)	78 (87.6)	P = 0.092
Early parental loss (before 18 years)	Present (n=149)	26 (17.4)	123 (82.6)	X2 = 7.325
	Absent (n=211)	17 (8.1)	194 (91.9)	p = 0.007
Positive-family history	Present (n=16)	06 (37.5)	10 (62.5)	X2 = 10.397
	Absent (n=344)	307 (10.8)	37 (89.2)	P = 0.001
Chronic illness	Present (n=32)	09 (28.1)	23(71.9)	X2 = 8.743
	Absent (n=328)	34 (10.4)	294 (89.6)	P = 0.003
Disability	Present (n=07)	03(42.9)	04 (57.1)	X2 = 6.48
	Absent (n=353	40 (11.3)	313 (88.7)	P = 0.011
Substance dependence	Present (n=146)	25 (17.1)	121 (82.9)	X2 = 6.363
	Absent (n=214)	18 (8.4)	196 (91.6)	P = 0.012
Overcrowding	Present (n=262)	39 (14.9)	223 (85.1)	X2 =7.915
	Absent (n=98)	04(4.1)	94 (95.9)	p = 0.005
Occupational Status	Unemployed/ (n=54) Retired	11 (3.0)	43 (79.6)	X2 = 13.608 p = <0.034
	Unskilled/ (n=64) Semiskilled	07 (10.9)	57 (89.1)	
	Skilled (n=15)	0 (0.0)	15 (100.0)	
	Clerical/shop/ farm (n=58)	03(5.2)	55 (94.8)	
	Professional (n=12)	04 (33.3)	08 (66.7)	
	Homemaker (n=157)	18 (11.5)	139 (88.5)	

Table 3 (a): Descriptive statistics for severity of depression with relation to the sex of the study subjects.

Sex	N	Mean	Standard deviation	Standard error	95% CI for mean		Min. Score	Max Score
					Lower limit	Upper limit		
Males	158	2.06	3.261	0.259	1.55	2.58	0	22
Females	202	2.91	4.304	0.303	2.31	3.51	0	23
Total	360	2.54	3.899	0.205	2.14	2.94	0	23

Table 3 (b): One-Way ANOVA (analysis of variance) for severity of depression by PHQ-9 Scores with relation to sex of the study subjects.

PHQ-9 scores	Sum-of squares	DF	Mean square	F value	Significance
Between Groups	63.826	1	63.826	4.236	0.040
Within groups	5393.587	358	15.066		
Total	5457.414	359	0.205		

Table 4: Distribution of knowledge about causes of depression in the study population according to sex.

Causes of depression (n=number of study subjects who said "yes")	Sex		Chi square	P value
	Males (n=158)	Females (n=202)		
Emotional stress due to home/family relationship breakup (n=304)	128(81.0)	176(87.1)	2.52	0.112
Financial or familial obligation (n=134)	134(84.8)	181(89.6)	1.87	0.172
Work related problems (n=284)	127(80.3)	157(77.7)	0.376	0.540
Physical illness (n=276)	118(74.6)	158(78.2)	0.619	0.431
Loneliness / lack of friends /antisocial (n=224)	95(60.1)	129(63.8)	0.526	0.468
Death of loved ones (n=255)	106(67.1)	149(73.8)	1.91	0.167
Less sleep or rest (n=220)	94(59.4)	126(62.4)	0.310	0.578
God punishing for past sins (n=219)	91(57.6)	128(63.4)	1.24	0.266
Old age (n=165)	71(44.9)	94(46.5)	4.638	0.098
Weak or nervous personality (n=131)	63(39.9)	68(33.7)	1.48	0.226
Witchcraft (n=133)	58(36.7)	75(37.1)	0.459	0.795
Polluted air (n=131)	55(34.8)	76(37.6)	0.853	0.653
Genetic (n=103)	52(32.9)	51(25.2)	8.362	0.015
Biological changes in brain (n=122)	71(35.1)	51 (32.2)	7.929	.019
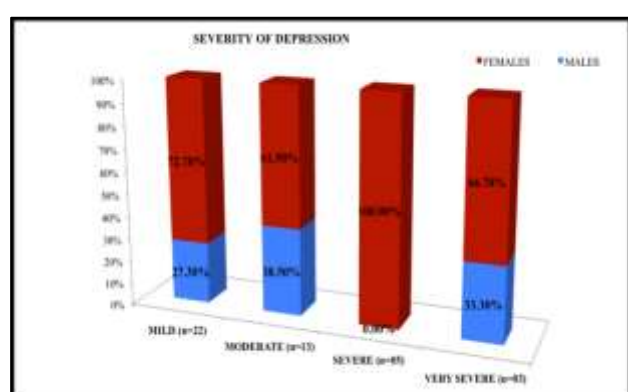
Figure 1: Distribution of severity of depression in the study area.

Knowledge about the Causes of Depression

The current study also assessed the knowledge of the study subjects of the rural area regarding the causes of depression. The results demonstrated that out of the total 158 males majority (84.8%) were of the view that Financial or familial obligations were the most common cause of depression , followed by emotional stress due to home/family relationship breakup (81.0%), followed by work related problems. Only 35.1% of the males were of the view that Biological changes in brain were a cause of depression.

Talking about the female subjects out of the total 202 - majority (89.6%) of females also considered financial or familial obligations to be the most common cause of depression , followed by emotional stress due to home/family relationship breakup (87.1%) , just like male study subjects. But only 32.3% of females reported Biological changes in brain as a cause of depression. The sad part was that higher number of females related depression with supernatural causes of depression like polluted air, witchcraft and punishment of past sins by god as compared to males, though these results were not found to be statistically significant in the current study.

DISCUSSION

The present study concluded that the overall prevalence of depression was 11.9%. The World Health Survey report, India, reported that the overall prevalence was found to be 13% in India.[12] Similarly the Chennai Urban

Rural Epidemiological Study (CURES) also found the rate of depression to be 15%, which was higher than the present study. The high rates of depression in the above mentioned study could have been due to very large sample size of 9994 as compared to that of our study.[13]

Considering the rates among the two sex groups, the CURES study gave supporting results for our study. In CURES study depression was found to be more prevalent in females than males (17.4% vs 14.5, p=0.001) compared to male subjects.[13] Another study showed the prevalence rate was 15.3% in women as compared to 9.8% in men that was quite comparable to our own study.[14] These studies also showed that severe and very severe grades of depression were contributed by higher number of females as compared to males. These findings were also in line with the current study.

In relation to the age of the study subjects, the result of the current study was similar to who reported that rates of depression were highest in the > 60 years age group.[13] The current study also showed that as age increases the rates of depression also increased. This finding was also in agreement with to the finding of Poongothai et al who observed a steady increasing trend in depression with age. Our results were also in agreement with the results found in a cross sectional community based study done on 627 individuals in Udupi taluka Karnataka in South India, where rates of depression were highest (34.4%) in the > 60 years old subjects.[15]

Certain studies have shown completely different results as compared to our study. A study (with 12376 participants, 5660 males and 6716 females of >15 years of age), showed that highest percentage (14.3%) of depression was found in the 20-24 years age group whereas lowest rates of 6.3% were found in the age group of > 65 years. These results were found to be highly significant (p = <0.0001).[14]

These differences in the results as compared to our study were contributed by break down of the joint family and the emergence of the nuclear family which explain the occurrence of depression at younger ages due to reduced family support. Other reasons for these differences could have been different demographic profile, different age groups used and the use of Composite International Diagnostic Interview (CIDI) developed by the World Mental Health Project to measure depression instead of a standardized questionnaire CIDI is a very time consuming and complicated tool, so it might have been difficult for the elderly respondents to understand it properly, which would have lead to underreporting of depression in > 65 years of age group.

Our results were in line with these results with regards to the marital status of the subjects. The CURES reported that the prevalence of depression was more among the widowed (26.6%) and married (15.9%) individuals as compared to unmarried (p=0.001). Another community based study conducted in the urban slum of Mumbai concluded that 56.5% of the subjects whose spouses have expired were found to be depressed as compared to 38% of the married cases and this difference was found to be significant (p = <0.05).[16]

Considering the socio-economic status, supporting results were obtained from the CURES study who showed that prevalence of depression was higher in the low income group (income, Rs.5000/month,$100) 15.7%, compared to the higher income group (income ranging between Rs.20,000/month,$400) 7.1% (Trend chi-square 70.3, p=0.001).

On univariate logistic regression, when higher income group was taken as reference, the odds ratio for lower income group (i.e income, Rs.5000) was 2.44 (p=0.010).[13] In a meta-analysis of 51 studies in the past the results indicated that low-SES individuals had higher odds of being depressed odds ratio = 1.81 (95% CI 1.57-2.10) (p= <0.001) than Highest SES individuals odds ratio = 1.68 (95% CI 1.49- 1.89) (p< 0.001).[17]

In terms of housing standards, our findings were supported by the findings of the survey done over 500 overcrowded households, in Great Britian that concluded 86% of the cases with overcrowded dwellings experienced depression.[18]

Another similar finding shown In a study done on 43,093 civilian non-institutionalized population aged 18 and older, at United States and Mexico,(National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) study)was that, the prevalence of depression with parental death before age 18 was 17.0% that were very much comparable to our prevalence of 17.4% in subjects with early parental loss and this association was found to be significant (p= 0.021).[19]

But one study reported that parental loss precipitates depression for a certain period of time, and after that time the loss is no longer a factor in the development of depression.[20] In a previous controlled clinical study of 300 depressives, 13% had experienced parental death before 17 years of age compared with 10.7% of the controls; this difference was not significant.

There were no significant differences between the two groups either before 11 or 17 years of age. Thus the study concluded that, experience of parental death as a child is not in itself a risk factor for depression as seen in psychiatric patients.[21] As compared to our own study where association between early parental loss and depression was found to be significant, these differences could have been due to the different methodologies used in the other studies and the study design, as most of the differing studies are case control seeking out their subjects from clinical settings These studies do not represent an entirely diverse population, and therefore have limited generalizability.

Present study also showed a significant association between depression and positive family history of mental disorders. A nationwide epidemiological study in Sweden showed that in 6.44% of the families an off spring and a parent was affected, giving a population attributable proportion of 4.04% and a familial Standardised incidence ratio of 2.68 (95% CI 2.56-2.84) and these were highly significant (p= <0.001). The study also concluded that familial history contributes significantly to depression.[22]

Like present study, another study showed that there was a positive association of depressive symptoms with disability and chronic physical illness, but on multivariate analysis it was found that the strength of the association between functional disability and depressive symptoms ranged between 0.16 and 0.37. The strength of the association between chronic diseases and depressive symptoms in these models was smaller, ranging between 0.08 and 0.20.The study concluded that though both disability and chronic physical illness are positively associated with depression the association of depressive symptoms with functional disability was stronger than with chronic physical conditions.[23]

Considering the knowledge about causes of depression, a study showed that responding to the questions on the potential causes of depression, respondents of the Indian community cited social and educational issues. Among the Indian community 61.07% (149) prioritized failures in work / achievement as one of the potential causes as compared to 83.5% subjects in our study , who believed that work related problems can give rise to depression.[24] These findings corroborated with the findings of the current study. In one more study it was shown that 90% of the respondents believed that recent job loss can lead to depression.[25] Another study reported that in terms of causes of depression, rural participants were more likely to endorse destiny and god and supernatural causes, whereas urban participants were more likely to endorse biological causes of depression.[26]

CONCLUSION

The current study concluded that overall prevalence of depression was 11.9%. Such considerable rates of depression among the people in rural areas could have been due to characteristics that are strongly associated with depression, including unstable employment level, low standard of living, higher number of female respondents and substance dependence. Female sex was found to have higher number of subjects with moderate, severe and very severe depression in the current study.

The current study also concluded that female sex had approximately twice the rates of depression to that in males. Higher prevalence of depression was also found in subjects who were illiterates, widowed, working as professionals, >60 years of age, low SLI, living in overcrowded conditions, having history of early parental loss and positive family history of mental illnesses and presence of substance dependence or any chronic illness. The study also concluded that overall, a moderate knowledge level of the causes of depression were observed among the general population in the Rural area, notably better in the males. Both males and females in the rural area were of the view that financial problems, work related problems and emotional stress due to familial breakups were more common causes of depression.

While only a few subjects identified biological disturbances in brain related neurotransmitters as the cause of depression. But sadly higher number of female respondents as compared to males were still of the view that supernatural cause like evil eye, polluted air, witchcraft and God's punishment for the past sins were responsible for depression. Such kind of knowledge among the rural respondents will ultimately lead to inclination towards the use of alternative and traditional medicines, which could undermine the respondents' willingness and ability to seek evidence-based mental health care.

The current study also recommends that apart from increasing mental health services and integrating this with general health services in the rural community there is also a dire need to focus on greater Information, Education and Communication activities regarding awareness of causes of depression and its prevention.

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