Original Research Article

A Logistic Regression Model to Assess Factors Influencing Schizophrenia Symptoms in Namibia

Nakunipa, E. N.N.[1], Pazvakawambwa, L.[1*], Iiyambo, P.[1]

[1]Department of Statistics and Population Studies, University of Namibia, Windhoek, Namibia
*Corresponding author: lpazvakawambwa@unam.na

ARTICLE INFO

ABSTRACT

Schizophrenia is a common mental disorder in Namibia and affects about 20 million people worldwide. Risk factors for schizophrenia in Namibia have not been extensively investigated. The objective of the study was to establish prevalence and factors influencing schizophrenia symptoms based on secondary data from the 2013 Namibia Demographic and Health Survey (NDHS). Descriptive statistics were computed to profile the background characteristics of the sample. Chi-square tests were conducted to assess association between socio-demographic variables and schizophrenia symptoms. Binary logistic regression was performed to establish determinants of schizophrenia symptoms. The prevalence of schizophrenia symptoms was 12.4% (13.6% among females and 11.0% among males). Regression results indicated that females (OR=1.159, 95% CI: 1.022-1.314, p=0.021) were more likely to have schizophrenia symptoms compared to their male counterparts. Those who resided in urban areas (OR=0.699, 95% CI: 0.609-0.803, p<0.001) were less likely to have schizophrenia symptoms compared to those who resided in rural areas. Those with no formal education (OR=0.378, 95% 0.273-0.523, p<0.001); those with primary education (OR=0.646, 95% CI: 0.501-0.834, p<0.001) and those with secondary education (OR=0.619, 95% CI: 0.495-0.775, p<0.001) were less likely to have schizophrenia symptoms compared to those with higher education. Results also showed that those who had never married (OR=0.275, 95% CI: 0.225-0.335, p<0.001); the married (OR=0.229, 95% CI: 0.184-0.284, p<0.001); and those living with a partner (OR=0.283, 95% CI: 0.225-0.355, p<0.001) were less likely to have schizophrenia symptoms compared to those who were on separation. Respondents who did not consume alcoholic drinks (OR=0.597, 95% CI: 0.526-0.677, p<0.001) were less likely to have schizophrenia symptoms compared to those who consumed alcoholic drinks. Schizophrenia symptoms were not significantly influenced by wealth index (p>0.05). There is need to step up gender-specific mental health programs especially in rural areas. Efforts to stabilize marital relationships at national level should be strengthened. Mental health could also be improved through drug abuse prevention and rehabilitation programs.

1. Introduction

Mental health is one of the key human rights (Dhaka, Musese, Kaxuxuena, Bakare, & Janik, 2017). The goal of the national policy for mental health is to achieve and maintain a high standard of mental health and wellbeing in the Namibian population MoHSS (2005). Mental health disorders are placed in discrete categories such as major-depressive disorder, bipolar disorder, schizophrenia and obsessive–compulsive disorder (OCD) based on theory and subjective symptoms (Adam, 2013). Schizophrenia is a common mental disorder in Namibia and affects about 20 million people worldwide. People with schizophrenia have

40% - 60% greater chances of dying than the general population
According to Srinivas, Neetha, Nair, Allencherry & Banerjee (2013), schizophrenia is a severe and disabling mental illness, that affects the brain, whereby a person sees or hears things that are actually not there. People suffering from schizophrenia struggle with differentiating between what is real and what is unreal, they find it difficult to think clearly and to behave normally. The delusions and hallucinations, despite obvious evidence that it is not true, clash with reality of life and are not understandable to others but are very real to the person experiencing them

(Smith, 2019).

A study done by Molina & Forastero (2015) was aimed at finding the percieved needs of schizophrenia patients and collecting enough data needed for effective therapies to improve the quality of life of patients. A qualitative analysis was done by interviewing 9 schizophrenia patients. Eight out of the nine participants believed that depression and anxiety are symptoms of schizophrenia and affects the quality of life negatively. This lead to an increase consumption of cigarettes and junk food, among other negative things, which had a negative impact on their already poor health. Participants expressed the negative side effects that the antipsychotic medication had on their physical health. Furthermore, the participants indicated that social stigma and lack of social resources to create new social networks also affected their quality of life negatively. They concluded that anxiety and depression are the two factors that mostly affects the quality of life of schizophrenia patients negatively. They also found out that establishing social links was necessary.

Gibson et al. (2013) conducted a study aimed at contributing to the understanding of treatment choices and the support services schizophrenia patients need in order to maximise the benefits from their medication. The study was a mixed methods questionnaire, applying quantitative and qualitative analyses. Thirty five people diagnosed with schizophrenia and on psycho-phamarceutical treatment for schizophrenia answered online and telephone questions about whether, how and why they changed or stopped their treatment recommendation, and what support they currently have or would like to have. Over half of the participants said that they were non adherent, however, when they were asked about intentional and unintentional adherence, 77% reported deviating from treatment recommendation. Alarmingly, 29% were non-adherent and were satisfied with being so. The participants' statisfaction with their support was positively correlated with their satisfaction with their medication. The study suggests that non-adherence, either intentional or unintentional is common amongst people diagnosed with schizophrenia and that it often occurs without health professionals' knowledge or support. The access to more information and emotional support, could help patients make treatment choices that will refelct the long term risks of non-adherence.

People with schizophrenia face many emotional, mental and physical challenges. The quality of life of schizophrenia patients is mostly characterized by depression and annxiety (Molina & Forastero, 2015). Buizza, Schulze, Bertocchi, Rossi, Ghilardi & Pioli (2007) articulated that, the living condition of people with schizophrenia depends on how severe the illness is, and on their accaptence in the communities. Schizophrenia patients and their relatives faces stigmazation and this often hinders the treatment process. With proper treatment, people with schizophrenia can lead productive lives, though some patients have to live with the symptoms for the rest of their lives. Schizophrenia treatment includes therapy and medication.

Factors influencing schizophrenia can be genetic, environmental, psychological or drug abuse related. John, Deshpande, Nimgaonkar, & Thelma (2013) states that schizophrenia is a weakening neuropsychiatric disorder that has 80% chances of being inherited. Stress during pregnancy or at a later stage of development are major environmental factors and socioeconomic status are also enviromental factors. Psychological factors include physical or emotional abuse as a child and any traumatic experience. The overuse of drugs is also a contributing factor of schizophrenia. Buadze, Stohler, Schulze & Liebrenz (2010) investigated if the use of cannabis causes schizophrenia or if the use of cannabis by schizophrenia patients have any influence on the relapses. Schizophrenia patients were interviewed, and the results indicated that none of the interviewed patients, described a link between cannabis and schizophrenia.

Jajodia, Baghel, Kaur, Jain, & Kukreti (2013) evaluated the association between the genetics diverseness of the neurodevelopment gene and the risk of schizophrenia. The study consisted of 482 schizophrenia cases and 401 age, sex matched controls. Genotypic tests were done, and multivariate logistic regression was used to analyze the data. The study reported that, there was an association between a gene named SLC1A3 (15p13) and the risk of schizophrenia development.

Burns, Tomita, & Kapadia (2013) performed a multilevel mixed-effects Poisson regression to investigate the relationship between Gini coefficients and incidence rates of schizophrenia controlling for covariates. The results from the 26-country systematic review showed that there was a significant positive relationship between incidence rate of schizophrenia and Gini coefficient. Countries that were characterized by a large rich-poor gap were at increased risk of schizophrenia and measures of income inequality were associated with schizophrenia incidence.

Nyer, et al. (2010) established that married or cohabitating participants who were 40 or older had a later age of onset of first psychotic episode than those who were single. Furthermore, single participants rated their quality of life lower than those who were married. Married participants had less suicidal ideation than those who were divorced, widowed or separated. They concluded that, in middle-aged and older

individuals with schizophrenia, marriage appeared to enhance quality of life.

Chun-Tea et al. (2018) examined the relationship between low-income and schizophrenia among the Taiwanese population based on a Cox proportional hazard regression analysis. The prevelance of schizophrenia was 1.23% in low income and 0.26% in non low income individuals. Evidence also showed that higher incidence rates were present in the 18-64 age category of lower income individuals.

Correlation analysis and binary logistic regression were used to examine the effect of age of onset of schizophrenia spectrum disorders on demographic and clinical variables. The age of onset had a significant relationship with the cignitive component of the Positive and Negative Syndrome Scale (PANSS) and Barratt Impulsive Scale (BIS) score. They concluded that, age of onset influenced illness course in patients with schizophrenia spectrum disorders (Yu-Chen & Yia-Ping, 2010).

According to Ashipala, Wilkinson, & Van Dyk (2016), mental health makes up five of the ten leading causes of health disability and out of the 3.1% disability rate in Namibia, 15% (7360) consisted of people registered as living with mental health problems.The 2013 Namibia Demographic and Health Survey (NDHS) reported that, schizophrenia is the common disorder of mental health in Namibia, followed by depression. The number of patients with schizophrenia increases every year.

Despite the increase in the number of patients with mental disorders, specifically schizophrenia, a study by Dhaka et al. (2017) reported that, mental health received low priority because of limited resources which are often directed to communicable and life-threatening diseases. Sankoh, Sevalie and Weston (2018) indicated that out of all clinical trials conducted in low income and middle-income countries in Africa, only 3% were of mental health.

NDHS (2013) reported that there has been an increase in mental health problems in Namibia, with schizophrenia being the common disorder. Even so, there is a lack of understanding of mental health problems among the public (WHO, 2017). Moreover, previous studies have shown that Namibia lacks scientific data collection systems, thus there was a challenge on epidemiological data on mental health (Ndjaleka, 2017). Therefore, the factors of schizophrenia in Namibia have not been extensively investigated. Thus, the study aimed at determining the factors that are associated with schizophrenia in Namibia.

The findings of this study are vital to the policy makers because identifying the factors associated with schizophrenia in Namibia will help them implement policies that are geared towards preventing schizophrenia. Moreover, knowing the factors would be essential to achieve the Sustainable Development Goal 3, which is designed to promote mental health and well-being. The objective of the study was to establish prevalence and factors associated with schizophrenia in Namibia.

2. Methods

The study was based on secondary data from the 2013 Namibia Demographic and Health Survey (NDHS) with 9,519 respondents. The sample for the 2013 NDHS was a two-stage stratified sample. In the first stage, 554 enumeration areas (EA) were selected with a stratified probability proportion to size selection from the sampling frame, of which, 269 in urban areas and 285 in rural areas. All the 13 regions were divided into urban and rural areas, thus every region was stratified into 26 sampling strata (13 urban strata and 13 rural strata). In the second stage, in every urban and rural cluster, a fixed number of 20 households were selected according to equal probability systematic sampling (NDHS Report, 2013).

The outcome variable of the study was based on whether respondents had symptoms of schizophrenia, thus, a respondent responding "Yes" to the question, *"Have you ever seen or heard things that are actually not there?" (Yes, No)*, was assumed as having symptoms of schizophrenia. The independent variables of the study were: age (15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50+) in years; gender (Male, Female); place of residence (Urban, Rural); employment Status (Yes, No); marital status (Never in a union, Married, Living with partner, Widowed, Divorced, No longer living together/separated); level of education (No education, Primary, Secondary, Higher); wealth quintile (Poorest, Poorer, Middle, Richer, Richest); and consumption of alcoholic drinks (Yes, No).

The Statistical Packages for Social Sciences (SPSS) version 26 was used to analyze the data. Firstly, descriptive statistics were calculated to describe various characteristics of the respondents, Chi-Square tests of association were used to analyze if there were any associations between the socio-economic & demographic factors and schizophrenia symptoms. The binary logistic regression was then used to establish factors influencing schizophrenia symptoms. Logistic regression allows categorical and continuous variables to predict categorical response variable (Jason, 2008; McDonald, 2008). Suppose that, there is a sample of n independent observations of the pair (x_i, y_i), $i = 1, 2, \ldots, n$, where x_i is the value of the independent variable, and y_i is the value of a dichotomous outcome variable for the ith subject. Let Y the outcome variable be coded as 0 and 1, where $Y = 1$ represents the presence of the outcome variable (schizophrenia symptoms) and $Y = 0$ represents the absence of the outcome variable (schizophrenia symptoms). Then, $Y \sim \text{Bernoulli}(\pi_i)$ where π_i is the

probability of the observed set of data, where, $p(Y = 1) = \pi$ and $p(Y = 0) = 1 - \pi$.

An appropriate model is the logistic model, with the likelihood function given by:

$$f(y_i, \pi_i) = \prod_{i=1}^{n} \pi_i^{y_i}(1 - \pi_i)^{1-y_i} ,$$

where $y_i = 0,1$. The mean value of the outcome variable, given the value of the independent variable is the key quantity in any regression problem. This quantity can be expressed as $E(Y|x)$ and is called the conditional mean (Hosmer Jr, Lemeshow, & Sturdivant, 2013). Let $\pi = E(Y|x)$, the specific form of the logistic regression model is:

$$\pi = \frac{e^{\beta_0 + \beta_1 x}}{1 + e^{\beta_0 + \beta_1 x}}$$

A transformation of $\pi(x)$ is the logit transformation and it is defined in terms of π as:

$$logit(\pi) = log\left[\frac{\pi}{1-\pi}\right] = \beta_0 + \beta_1 x ,$$

where, β_0 is the intercept and β_1 is the coefficient of x

Equivalently, consider a collection of p independent variables denoted by a vector $x = \begin{bmatrix} x_1 \\ \vdots \\ x_p \end{bmatrix}$. The logit transformation of the multiple logistic regression is given by:

$$logit(\pi_i) = log\left[\frac{\pi_i}{1-\pi_i}\right] = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_p x_p .$$

And the multiple logistic regression model is given by:

$$\pi_i = \frac{e^{\beta_0 + \beta_1 x_1 + \cdots \beta_p x_p}}{1 + e^{\beta_0 + \beta_1 x_1 + \cdots \beta_p x_p}}$$

Fitting a multiple logistic model requires that we obtain values of the vector $\beta = \begin{bmatrix} \beta_0 \\ \vdots \\ \beta_p \end{bmatrix}$.

Regression coefficients are interpreted using odds ratio as a measure of association. The odds ratio denoted OR is given by e^{β} (Hosmer Jr et al., 2013). If OR is equal to 1, then the increase in the independent variable has no influence on the probability of the response variable, OR greater than 1 indicates an increase in the probability of the outcome variable to occur and OR less than 1 indicates a decrease in the probability of the outcome variable to occur.

3. Results
3.1 Descriptive Statistics

The sample consisted of 9519 respondents. Table 1 shows that, 53% were females and 47% were males. Most of the respondents were aged between 20 and 24 with 20.9% and the least were between the ages 45-49 with 4.3%. About 53% of the respondents were from rural areas, whereas, 47.4% were from urban areas. Furthermore, 59.4% of the respondents had secondary education as their highest level of education and the least had higher education with 6%, and most of them (22.4%) were from middle class, in terms of the wealth index, whereas, the least which is 16.4% where from the richest class. Furthermore, the majority (51.5%) were never in a union, whereas, 0.7% were widowed. Fifty one percent of the respondents were working and 52.5% consumed alcohol. Out of 9519 respondents, (1176) 12.4% indicated having experienced schizophrenia symptoms.

Table 1: Socio-demographic information of the respondents

Characteristics		Number of respondents	Percentage (%)
Sex	Male	5043	53
	Female	4476	47
Age	15-19	1201	12.8
	20-24	1993	20.9
	25-29	1944	20.4
	30-34	1498	15.7
	35-39	1182	12.4
	40-44	760	8
	45-49	410	4.3
	50+	531	5.6
Type of residence	Urban	4508	47.4
	Rural	5011	52.6
Higher education level	No education	917	9.6
	Primary	2374	24.9
	Secondary	5657	59.4
	Higher	571	6
Wealth index	Poorest	1758	18.5
	Poorer	1978	20.8
	Middle	2129	22.4
	Richer	2095	22
	Richest	1559	16.4

Marital status	Never in union	4905	51.5
	Married	2120	22.3
	Living with partner	2045	21.5
	Widowed	69	0.7
	Divorced	91	1
	Separated	289	3
Is the respondent currently working?	No	4878	51.2
	Yes	4641	48.8
Does the respondent Consume alcoholic drinks	No	4525	47.5
	Yes	4994	52.5
Have you ever seen/heard things that are not there?	No	8343	87.6
	Yes	9519	12.4

3.2. Results of Chi-Square Tests of Association between socio-economic variables symptoms of schizophrenia

The results of Chi-square tests of association at 5% level of significance are summarized in Table 2. Schizophrenia symptoms were significantly associated with sex (Chi-square with (Chi-square = 14.959, p value < 0.001); type of place of residence (Chi-square = 15.411, p value < 0.001); highest educational level attained Chi-square = 27.956, p value < 0.001); wealth index Chi-square =39.123, p value < 0.001); marital status Chi-square = 28.057, p value < 0.001); and consumption of alcoholic drinks Chi-square = 56.043, p value < 0.001). However, there was no significant association between schizophrenia symptoms and respondent age (p=0.425) and working status (p=0.508). Therefore, the variables respondents' age and respondents' working status did not qualify to be input into the binary logistic regression model to establish the determinants of schizophrenia symptoms.

Table 2. Results of Chi-Square Tests of Association between socio-economic variables symptoms of schizophrenia

Independent Variable	Have you ever seen/heard things that are not there?		Chi-Square Statistic	p-value
	No (%)	Yes (%)		
Sex				
Females	86.4	13.6	14.959	**<0.001**
Males	89.0	11.0		
Age in 5-year groups				
15-19	88.8	11.2	7.033	0.425
20-24	87.7	12.3		
25-29	87.4	12.6		
30-34	87.2	12.8		
35-39	86.6	13.4		
40-44	86.8	13.2		
45-49	87.8	12.2		
50+	90.4	9.6		
Type of Place of Residence				
Urban	89.0	11.0	15.411	**<0.001**
Rural	86.4	13.6		
Highest Educational Level				
No Education	91.2	8.8	27.956	**<0.001**
Primary	85.8	14.2		
Secondary	87.4	12.6		
Higher	91.9	8.1		
Wealth Index				
Poorest	85.7	14.3	39.123	**<0.001**
Poorer	87.4	12.6		
Middle	86.3	13.7		
Richer	87.5	12.5		
Richest	92.2	7.8		
Marital Status				
Never in Union	87.6	12.4	28.057	<0.001
Married	89.7	10.3		
Living with partner	87.2	12.8		
Widowed	76.8	23.2		
Divorced	83.5	16.5		
Separated	81.3	18.7		
Respondent Currently working?				
No	87.9	12.1	0.437	0.508

Yes	87.5	12.5		
Does the respondent consume alcoholic drinks?				
No	90.3	9.7	56.043	**<0.001**
Yes	85.2	14.6		

3.3. Results of Binary Logistic regression to establish the determinants of schizophrenia symptoms.

The results of binary logistic regression to establish the determinants of schizophrenia symptoms are presented in Table 3. The results indicated that females (OR=1.159, 95% CI: 1.022-1.314, p=0.021) were more likely to have schizophrenia symptoms compared to their male counterparts. Those who resided in urban areas (OR=0.699, 95% CI: 0.609-0.803, p<0.001) were less likely to have schizophrenia symptoms compared to those who resided in rural areas. Those with no formal education (OR=0.378, 95% 0.273-0.523, p<0.001) those with primary education (OR=0.646, 95% CI: 0.501-0.834, p<0.001) and those with secondary education (OR=0.619, 95% CI: 0.495-0.775, p<0.001) were less likely to have schizophrenia symptoms compared to those with higher education. Results also showed that those who had never married (OR=0.275, 95% CI: 0.225-0.335, p<0.001); the married (OR=0.229, 95% CI: 0.184-0.284, p<0.001); and those living with a partner (OR=0.283, 95% CI: 0.225-0.355, p<0.001) were less likely to have schizophrenia symptoms compared to those who were on separation. Respondents who did not consume alcoholic drinks (OR=0.597, 95% CI: 0.526-0.677, p<0.001) were less likely to have schizophrenia symptoms compared to those who consumed alcoholic drinks. Schizophrenia symptoms were not significantly influenced by wealth index (p>0.05).

Table 3: Results of Binary Logistic regression to establish the determinants of schizophrenia symptoms

Variable	p-value	Odds Ratio	95% Confidence Interval for Odds Ratio	
			Lower	Upper
Sex				
Females	**0.021**	1.159	1.022	1.314
Males		1.000		
Type of Place of Residence				
Urban	**<0.001**	0.699	0.609	0.803
Rural (Ref)		1.000		
Highest Educational Level				
No Education	**<0.001**	0.378	0.273	0.523
Primary	**0.001**	0.646	0.501	0.834
Secondary	**<0.001**	0.619	0.495	0.775
Higher (Ref)		1.000		
Wealth Index				
Poorest	0.291	1.148	0.889	1.482
Poorer	0.520	1.082	0.852	1.374
Middle	0.116	1.197	0.956	1.497
Richer	0.241	1.135	0.919	1.402
Richest (Ref)		1.000		
Marital Status				
Never in Union	**<0.001**	0.275	0.225	0.335
Married	**<0.001**	0.229	0.184	0.284
Living with partner	**<0.001**	0.283	0.225	0.355
Widowed	0.076	0.583	0.322	1.057
Divorced	**0.003**	0.407	0.226	0.731
Separated (Ref)		1.000		
Does the respondent consume alcoholic drinks?				
No	**<0.001**	0.597	0.526	0.677
Yes		1.000		

4. Discussion

Results indicated that schizophrenia symptoms were influenced by gender, place of residence, level of education, marital status and alcohol consumption.

The socioeconomic status (measured by wealth index) did not influence schizophrenia symptoms.

The study found that, in Namibia, women had a higher chance of having schizophrenia symptom compared to men in 2013. However, these findings

contradict Chun-Tea, et al. (2018) who found that schizophrenia was common in men than in women. Riecher-Rossler, Butler & Karlkani (2018), also reported gender disparities schizophrenic psychoses citing differences in terms of symptomatology, comorbidity and neuro cognition. On the other hand, when focusing on functional rather than symptomatic outcomes of schizophrenia, women outperformed men in terms of educational achievement occupational functioning and interpersonal functioning (Seeman, 2019).

Respondents that were living in rural areas were found to be more likely to show schizophrenia symptoms compared to those who were living in urban areas. The results were in agreement with Solmi, Dykxhoorn, and Kirkbride (2017) who found that the most consistent evidence of rural-urban gradients in mental health risks existed in schizophrenia and suicide, with more mixed evidence in relation to common mental disorders.

Respondents with no formal education, those with primary education and those with secondary education were less likely to have schizophrenia symptoms compared to those with higher education. Improving educational level did not decrease the risk of schizophrenia as suggested by Luo, Pang, Zhao, Guo, Zhang & Zheng (2020).

The study found that there was no relationship between income (wealth) and showing or not showing of schizophrenia symptoms. This was in contrast with the findings from the study done by Burns, Tomita, & Kapadia (2013), which concluded that income was associated with schizophrenia. Hudson (2005) found that socioeconomic status impacted directly on the rates of mental illness as well as indirectly through the impact of economic hardship on low- and medium-income groups in the US. In China, Ran, Huang, Mao, Lin, Li, & Chan (2017) also established that low family economic status is a predictive factor of poor long-term outcomes of persons with schizophrenia and recommended that individual's family economic status should be taken into account when making mental health policy and providing community-based mental health services.

Results also showed that those who had never married; the married, and those living with a partner were less likely to have schizophrenia symptoms compared to those who were on separation. In rural China, being married was predictive of more favorable 14-year outcomes of persons with schizophrenia probably due to the fact that marriage can be instrumental for enhancing family-based support and caregiving, as well as improving the community tenure of persons with schizophrenia. The authors stressed the importance of developing programs to enhance opportunity for persons with schizophrenia to get and stay married (Ran, Wong, Yang, Ho, Mao, Li, & Chan, 2017). Negative symptoms, such as depression and suicidal thoughts were higher in schizophrenic patients who were not married compared to those who were married. Those married or cohabiting had a later age of onset of first psychotic episode or hospitalization compared to those who were single Nyer, Kasckow, Fellows, Lawrence, Golshan, Solorzano & Zisook (2010).

Respondents who consumed alcoholic drinks had higher chances of showing schizophrenia symptoms compared to those who did not. Buadze et al., (2010) concluded that clinicians should not let patients who do not have a link with cannabis use go through a treatment meant for patients that have a link with cannabis.

5. Conclusions

Results indicated that females were more likely to have schizophrenia symptoms compared to their male counterparts. Those who resided in urban areas were less likely to have schizophrenia symptoms compared to those who resided in rural areas. Those with no formal education, primary education and secondary education were less likely to have schizophrenia symptoms compared to those with higher education. Results also showed that those who had never married, the married and those living with a partner were less likely to have schizophrenia symptoms compared to those who were on separation. Respondents who did not drink alcohol were less likely to have schizophrenia symptoms compared to those who consumed alcoholic drinks. Schizophrenia symptoms were not significantly influenced by socio-economic status.

6. Recommendations

There is need to step up gender-specific mental health programs especially in rural areas. Efforts to stabilize marital relationships at national level should be strengthened. Mental health could also improve through drug abuse prevention and rehabilitation programs.

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