

Factors Associated With Depression In Doctors Who Will Work In Rural Areas Of Peru.

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Introduction: The doctors who perform the Peruvian service will be exposed to loneliness, labor problems and others, which can have mental repercussions on them. The objective was to determine factors associated with depression among physicians who will work in rural Peru. Method: Observational, cross-sectional and analytical study of secondary data. Surveys were collected from newly graduated Peruvian doctors who were to begin the Rural and Urban-Marginal Health Service in a few weeks. Depression was defined according to the Zung test, being associated to social and educational variables. Results: Of the 704 respondents, 30.0% (211) had a score higher than 50 (depressed), 67.0% (471) had a score close to the cut-off point for depression. In the multivariate analysis, a higher frequency of depression was associated with being female (RR: 1.09, 95% CI: 1.09-1.10, p value <0.001), having a sentimental partner (RPa: 1, 12, 95% CI: 1.12-1.13, p value <0.001), having studied at a university in Lima (RP: 1.07, 95% CI: 1.06-1.09, p value <0.001), and having medical relatives (RP: 1.20, 95% CI: 1.09-1.33, p value <0.001), adjusted by three variables. Conclusions: We found a significant percentage of physicians who had depression, and another major group that was close to having it. It is important to carry out mental health programs among the doctors who perform rural activity, since the mental condition could have a negative impact on some aspects of their professional life.

Key words: Depression, rural health services, occupational health, physicians, Peru. (Source: DeCS BIREME).

Introduction

The Rural and Urban-Marginal Health Service (SERUMS, for its acronym in Spanish) is a compulsory activity for health professionals who wish to work in public health institutions in Peru (1). That is why the vast majority of professionals have to do it, especially because, if they do not, they will not be able to apply for a medical specialty. This generates a sort of implicit obligation to carry out this work in rural areas of Peru (2). Thus, thousands of health professionals have to migrate to remote, and often rugged, areas of the national territory

annually (3).

Multiple reports have mentioned problems with the SERUMS, ranging from administrative issues (4) to others that occurred due to diverse causes (5). All this creates a unique work environment, which is often the reason why professionals are discouraged from working in areas with similar characteristics (6). It is important to evaluate the mental health of those who will carry out this activity, as multiple local investigations show that undergraduate students already have problems such as Burnout Syndrome (7) or even depression (8,9). Therefore, the objective of this study

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was to determine the factors associated with depression among doctors who will work in rural areas of Peru.

Methodology

An observational, cross-sectional and analytical study of a secondary data analysis was performed. The surveys were collected among recently graduated Peruvian doctors who would work for the Rural and Urban-Marginal Health Service (SERUMS) during 2016-2017.

Doctors who attended the SERUMS induction course, who stated that they would work for SERUMS in 2016-2017, and who agreed to participate in the research, were included. 23 respondents were excluded for not having answered the questions of the Zung test. Additionally, other 50 surveys were excluded for not having answered some of the variables evaluated (exclusion rate = 9.7%).

Depression was defined according to the score obtained in the Zung test. This consists of 20 closed multiple-response questions (which have four possible alternatives according to the frequency of each of the symptoms or states that they evaluate: small amount of time, some time, a good part of the time or most of the time). Those who had scores equal to or greater than 50 (possible range of scores: 20-80 points) were considered as positive for depression.

Additionally, other social and educational characteristics of the respondents were measured: sex (male or female), age (measured in years), if they currently have a romantic partner (yes or no), the location of their university (Lima or outside Lima), if they had studied any other career before medicine (yes or no), and if they had medical relatives (yes or no).

This survey was conducted during an annual event that gathers the largest number of doctors who are going to work for SERUMS. Authorization to conduct the survey were requested before the application. The survey was conducted while the respondents were in a recess between exhibitions (each on their seat, without distractions and with the comfort required to answer the survey). After that, two of the authors double-typed the data. Subsequently, a purification (according to the

selection criteria) and quality control process was carried out; the latter was conducted in two steps (one previously performed manually by the student authors, and then one of the authors carried out a second quality control using the filters of the Microsoft Excel program). All this information was exported to the statistical program Stata 11,1 (StataCorp LP, College Station, TX, USA).

For the statistical analysis, a descriptive step was performed first, where the frequencies and percentages of the categorical variables were obtained, as well as the medians and interquartile ranges of the quantitative variables (post-evaluation of the normality criteria according to the Shapiro-Wilk statistical test). Analytical statistics were then calculated, obtaining PR (prevalence ratios), 95% CI (95% confidence intervals), and P values. All of them were obtained with generalized linear models, Poisson family, log link function, and robust models, and using the university type as an adjustment cluster. For analytical statistics, P values <0.05 were taken as statistically significant.

The research was all always conducted in an ethical way. The data was confidential and only managed by the group that designed the study. The base research project was evaluated and approved by the ethics committee of the Universidad Peruana Cayetano Heredia, as it was part of the baseline measurement of a master's thesis.

Results

Of the 704 respondents who met the selection criteria, women had a higher frequency of depression (31.2% versus 28.4% of men); age was not a factor in having this condition. Additionally, those with a romantic partner (31.5% versus 28.3% of those without a partner), those who studied at a university in Metropolitan Lima (30.3% versus 27, 6% who studied at other universities), those who identified human medicine as their first career (30.2% versus 27.3% of those who had a previous career), and those who reported having a medical family member (32.8% versus 27.3% of those without medical relatives) also presented higher rates of depression

Table 1. Social and educational characteristics of doctors with depression among those who work in rural areas of Peru

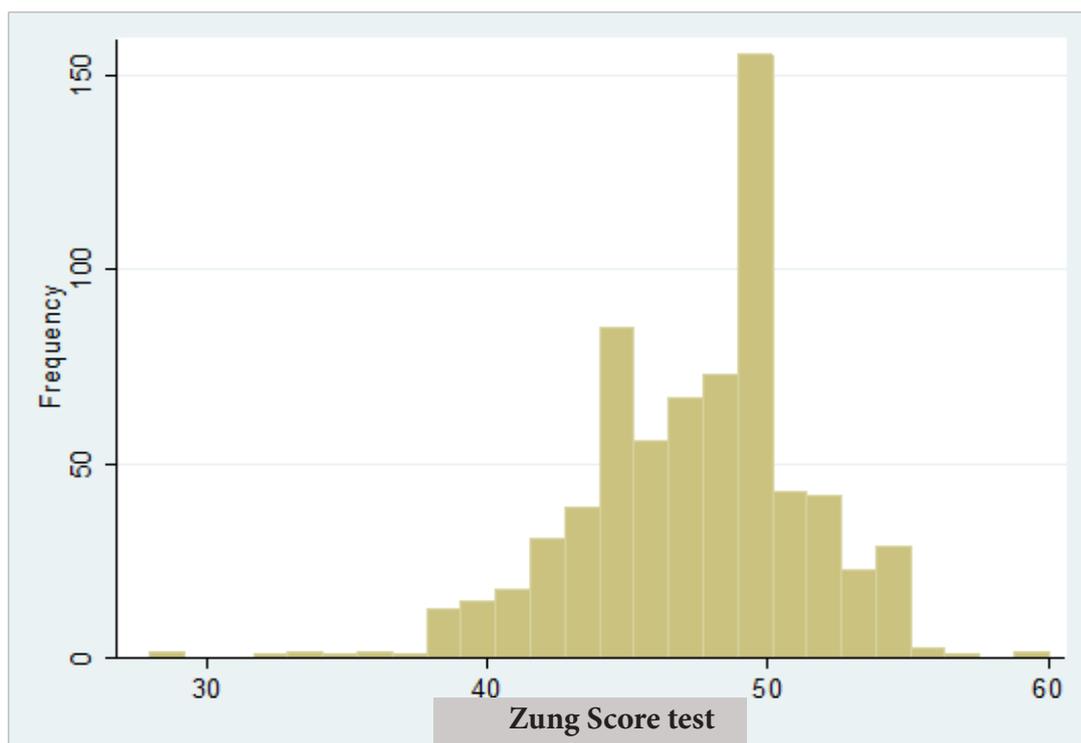
Variable	With Depression N (%)		P Value
	YES	NO	
Sex			
Female	122(31.2)	269(68.8)	0.426
Male	89(28.4)	224(71.6)	
Age (years)*	25(24-27)	25(24-27)	0.995
Has a partner			
Yes	116(31.5)	252(68.5)	0.347
No	95(28.3)	241(71.7)	
Studied in			
Universidad en Lima	187(30.3)	430(69.7)	0.604
Another university	24(27.6)	63(72.4)	
It is their first career			
Yes	196(30.2)	453(69.8)	0.649
No	15(27.3)	40(72.7)	
Has relatives who are doctors			
Yes	113(32.8)	232(67.2)	0.114
No	98(27.3)	261(72.7)	

Table 2. Bivariate and multivariate analysis of depression in doctors who will work in rural areas of Peru according to social and educational variables.

Variable	Bivariate		Multivariate	
	PR (IC95%)	P value	PRa (IC95%)	P value
Female	1.09(1.08-1.09)	<0.001	1.09(1.09-1.10)	<0.001
Age (years)	0.99(0.95-1.04)	0.713	0.99(0.93-1.06)	0.804
has a partner	1.13(1.08-1.18)	<0.001	1.12(1.12-1.13)	<0.001
Studied in Lima	1.08(1.04-1.12)	<0.001	1.07(1.06-1.09)	<0.001
It is their first career	1.05(1.05-1.06)	<0.001	1.04(0.77-1.39)	0.808
Has relatives who are doctors	1.19(1.08-1.31)	<0.001	1.20(1.09-1.33)	<0.001

PR (prevalence ratio), 95% CI (95% confidence interval), PRa (adjusted prevalence ratio) and p values were obtained with the generalized linear models, with Poisson family, log link function, robust models and using the university type as an adjustment cluster.

Figure 1. Zung test scores among doctors who will work in rural areas of Peru.



The Zung test scores revealed that 30.0% (211) had a score greater than 50, which classified them in the depression group. It should be noted that 67.0% (471) of the respondents had between 41-49 points, which is not enough to classify them as depressed, but who are nevertheless close to developing this condition.

The bivariate analysis found that sex was associated with depression ($p < 0.001$), as did having a romantic partner ($p < 0.001$), studying at a university in Lima ($p < 0.001$), the fact that medicine was their first career ($p < 0.001$) and the fact of having medical relatives ($p < 0.001$). The multivariate analysis were: female sex (PRA: 1.09; 95% CI: 1.09-1.10; P value < 0.001), having a romantic partner (PRA: 1, was associated with a higher frequency of depression) 12; 95% CI: 1.12-1.13; P value < 0.001), having studied at a university in Lima (PRA: 1.07; 95% CI: 1.06-1.09; P value < 0.001) and having medical relatives (PRA: 1.20; 95% CI: 1.09-1.33; P value < 0.001). These variables were adjusted for age, the fact that human medicine was their first career, and for the type of university.

Discussion

Three out of ten doctors were found to have depression, and the vast majority had borderline scores for the diagnosis of the condition. This is a significant finding, since Peruvian law requires institutions to monitor the health of their workers, especially those who are listed in high-risk careers, as is the case in the health sector (10). For this reason, the hiring entities - the Ministry of Health, EsSalud, the armed forces, and the Health Police - have the duty to develop occupational exams that take care of the mental health of their workers; otherwise, they are exposed to the corresponding sanctions (11), because this is a risk for the mental health of workers in the health sector. These sanctions have precedents in international realities, where the health and safety of the workers are ensured, because various adverse events may occur if they are not monitored (12). Especially because this pathology has been reported among undergraduate students in various medical schools in Peru (9), where in addition to depression, it has been reported that they can suffer from anxiety, irritability, and other chronic disorders (13). If

this is not addressed at the undergraduate stage, it can continue until they become doctors (8); thus, it becomes an important pathology in the professional practice of doctors and other health professionals. The institutions in charge are recommended to conduct research to determine the degree of impact and the repercussions that this pathology has on the doctors who work for the SERUMS.

It was found that women had a higher frequency of depression than men. This is similar to the findings reported by Paula and Galán, who have determined that being a woman is associated with a higher risk of depression (8,14), meaning it could be even considered a risk factor for developing chronic depression (15), among other consequences that this illness brings. This condition is probably related to social and physiological aspects of women, which should be explored in subsequent research studies in order to develop specific detection and management programs.

Additionally, those who had a romantic partner showed a higher frequency of depression; this finding concurs with the data of an investigation that shows that the greater severity of depressive symptoms are associated with dysfunctional couples (16), since depression is closely related to the quality of the relationship (17). Causality cannot be established (whether having a romantic partner causes depression) due to the type of design used (cross-sectional). Furthermore, it was not possible to add more variables to characterize the type of relationship as it was a secondary data analysis study. Therefore, it is recommended that longitudinal research be conducted to learn more about this topic.

Graduates of universities in the country's capital had a higher frequency of depression. This could be attributed to the hostile environment in which the students live, since there are various factors that affect mental health in the capital, such as the high crime rate, corruption, feeling of insecurity (18), environmental and acoustic pollution, and problems related to large populations (19), among others. No similar reports were found in populations similar to the one evaluated. However, there is a Peruvian publication that evaluated rural residents and reported a lower frequency of depression among rural and provincial residents (20). Therefore,

these professionals could change their level of depression by exposing themselves to the rural locations where they will carry out their professional practice for a year, which is the reason why research to evaluate this aspect prospectively is needed.

Finally, those with medical family members had more depression. This could be explained by the fact that they feel greater pressure from their relatives, which would cause a higher level of stress, triggering depressive symptoms (21).

There was a limitation of selection bias, since the type of sampling does not allow inferences to be made for all the doctors who will work for the SERUMS. However, the objective of the research was not to try to make a general inference, but to find the factors associated to those suffering from this disease. On the other hand, there was an information bias, since, being an analysis of secondary data, it was not possible to have access to more important variables or to a larger population. Therefore, it is recommended that the institutions related to the topic propose research to tackle this problem.

According to the findings, three out of ten doctors who will work in rural areas suffer from depression, this condition being associated with sex, having a romantic partner, having studied at a university in Lima, and having relatives who are doctors. Institutions involved are recommended to carry out more research on the subject, since these professionals will be exposed for a whole year to positive things (quietness, low levels of insecurity, etc.) and negative things (loneliness, distance from acquaintances and daily activities, etc.) during their work for the SERUMS, which can have several repercussions on them.

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