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Factors associated with staffing of medical doctors and nurses in rural areas in Zambia

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ABSTRACT

***Objective*:** To determine factors associated with staffing of doctors and nurses in rural health institutions in Zambia.

Design: A cross sectional study was conducted among qualified medical doctors and nurses, and student doctors and nurses. The study was done in all the three Central hospitals in Zambia (namely: Kitwe Central Hospital, Ndola Central Hospital, and the University Teaching Hospital), Kasama General Hospital, and Chinsali District Hospital. All doctors, nurses and students found at the stations at the time of interviews were requested to take part in the study.

***Main Outcome Measure*:** Willingness to work in rural areas for at least five years.

Results: Totals of 133 qualified staff (doctors and nurses) and 97 students were recruited into the study. Among practicing doctors and nurses, age and marital status were the only factors that were significantly associated with the outcome in a multivariate analysis. At each birthday qualified staff were 8% (OR=1.08, 95%CI [1.00, 1.16], p=0.046) more likely to be willing to work in rural areas for at least five years. Qualified staff who were single were 55% (OR=0.45, 95%CI [0.21, 0.97], p=0.043) less likely to be willing to work in rural areas for at least five years compared to those who were married. For student doctors and nurses, curricula and age were the only factors that were significantly associated with the outcome. At each birthday, students were 23% (OR=1.23, 95%CI [1.04, 1.44], p= 0.013) more likely to be willing to work in rural areas for at least 5 years. Students who were of the conviction that the curricula prepared them adequately to work in rural areas were 6.56 (95%CI [1.80, 23.83], p=0.004) times more likely to be willing to work in rural areas for at least five years compared to those who were of the conviction that the curricula did not prepare them to work in the rural areas.

***Conclusion*:** A combination of factors, some of which we have identified in the current study, must be considered in the improvement of health personnel staffing levels in rural Zambia.

INTRODUCTION

Shortages of health care providers have existed in Zambia for a long time. For instance, in 2000, there were 698 doctors and 7021 Registered and Enrolled nurses [1] attending to a population of 9.9 million [2], with ratios of one doctor and nurse to 14,184 and 1,411 people, respectively. These ratios are far below those recommended by the World Health Organization for Africa, of 1:5,000 and 1:700 for doctors and nurses respectively. This shortage of doctors and nurses has been more critical in rural than urban settings of Zambia. Miti [3] reported that unqualified health workers staffed about 33% of rural health centers. However, the shortage of work force in rural settings is a worldwide problem. In a study done in Papua New Guinea [4], it was found that out of 124 doctors trained in the previous twenty-seven years, only sixty-six were still working in the country, and these were evenly distributed across the country except in rural settings. In Australia, it was noted that the non-metropolitan areas were relatively underserved by doctors as compared to the metropolitan areas [5].

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Countries have considered several measures to address the shortage of medical personnel in rural health institutions. Among the factors considered in Nigeria and Nepal is the introduction of a postgraduate training for General Practice for doctors who would serve the country's district hospitals [6,7]. In Zambia, in order to attract doctors and nurses to work in rural areas several initiatives have been considered [3], including the Zambia Health Workers' Retention Scheme for medical doctors in rural areas with support from the Royal Netherlands Government, and rehabilitation of health institutions and staff accommodation. Despite these efforts to redress the situation by the Government of the Republic of Zambia with the help of co-operating partners, the shortage of medical personnel in rural areas has persisted. The aim of this study was to determine factors associated with staffing of doctors and nurses in rural settings in Zambia that may not have been considered before.

METHODOLOGY

Study setting

The study was conducted in all the three Central Hospitals in Zambia (namely Kitwe Central Hospital, Ndola Central Hospital and the University Teaching Hospital), Kasama General and Chinsali District Hospitals in Zambia.

Study design, sample size, and sampling method

This was a cross sectional study. All Zambian doctors and nurses in government health institutions in the conveniently selected hospitals were requested to take part in the study. In total 133 doctors, and nurses, and 97 medical and nursing students were interviewed.

Questionnaire

Questionnaires were administered to the students just before or after classes/lectures (the time when most of the students were found in one place), while to the doctors and nurses, it was administered to them while on duty, or at any other convenient times, they chose. Items in the questionnaire included, in addition to socio-demographic factors, compared the following factors between rural and urban settings: Salary, Job availability, Job challenge, Patient contact, Housing expenses/availability, General living expenses, Continuing education, Schools for children, Private practice, Standard of living, Prestige among colleagues, Prestige in community, Environmental surrounding, Chance to be of service, Transport, and Opportunities for career development

Ethical considerations

The study was approved by the University of Zambia Research Ethics Committee. Permission to conduct the study in the health institutions was sought from the respective Directors of the health institutions. An information sheet about the study and a Consent form was attached to the questionnaire for respondents to read and consent to participating in the study. All information was kept confidential and the results provided in such a way that no individual could be identified.

Data management and analysis

Data entry and analysis were done using Epi Info and SPSS version 14.0. Willingness to work in a rural area for at least 5 years was the outcome of the study. Bivariate analysis involved the use of the Chi-square test to determine associations between qualitative variables in the exposure category and the outcome. Backward logistic regression analysis was used to determine independent predictors for willingness to work in rural areas for at least five years. The significance level was set at the 10% level for bivariate analysis and at the 5% for multivariate analysis.

RESULTS

Factors associated with willingness to work in rural areas for at least 5 years among qualified doctors and nurses

Out of 133 respondents, 16 (12.0%) were willing to work in rural areas for at least five years. The median (Q_1, Q_3) age in years for those willing and those not willing to work for at least five years in rural areas were 37 (30,44), and 30(28,35) years, respectively (p=0.018). The other factors that were considered in the study for qualified doctors and nurses that were significantly associated with willingness to work in rural areas for at least five years at the 10% level were sex (p=0.062), marital status (p=0.007), compulsory rural posting (p=0.017), and more chances of being of service in rural areas (p=0.048), as shown in Table 1.

Table 1. Factors associated with willingness for qualified doctors and nurses to work in rural areas for at least five years in Zambia

Factor	Total	n (%)[a]	P value
Sex			
Male	47	9 (19.1)	0.062
Female	86	7 (8.1)	
Marital status			
Single	58	2 (3.4)	0.007
Married	75	14 (18.7)	
Compulsory rural posting after internship is good			
Yes	71	13 (18.3)	0.017
No	62	3 (4.8)	
More chances of being of service in rural areas			
Yes	66	12 (18.2)	0.048
No	51	3 (5.9)	

[a] percents are factor specific

After adjusting for confounding factors, age and marital status were the only factors that remained significantly associated with the outcome. At each birthday, qualified staff were 8% (OR=1.08, 95%CI [1.00, 1.16], p=0.046) more likely to be willing to work in rural areas for more than at least five years. Qualified staff who were single were 55% (OR=0.45, 95%CI [0.21, 0.97], p=0.043) less likely to be willing to work in rural areas for at least five years compared to those who were married.

Factors associated with willingness to work in rural areas for at least five years among student doctors and nurses

Out of 97 respondents, 31 (32%) were willing to work in rural settings for at least five years. The median age (Q_1, Q_3) for students who were prepared to work in rural settings for at least five years was 29 (25, 32) years compared to 26 (24, 27) years for students who were prepared to work in rural settings for less than five years only (p<0.001). The other factors (Table 2) that were significantly associated with willingness to work in rural areas for at least five years at the 10% level among student doctors and nurse were marital status (p=0.017), preference for level of medical care (p=0.004), compulsory rural posting (p=0.007), past experience in rural areas (p=0.042), more jobs for medical personnel in rural areas (p=0.003), more chances to be of service in rural areas (p=0.076), curriculum adequately prepares students to work in rural areas (p=0.003), patient contact more in urban areas (p=0.016), and better environmental surrounding in urban areas (p=0.005).

Table 2. Factors associated with willingness for student doctors and nurses to work in rural areas for at least five years in Zambia

Factor	Total	n (%)[a]	P value
Marital status			
Single	74	19 (25.7)	0.017
Married	23	12 (52.2)	
Preference for level of medical care			
Primary	22	13 (59.1)	0.004
Secondary	28	9 (32.1)	
Tertiary	47	9 (19.1)	
Compulsory rural posting after internship is good			
Yes	19	11 (57.9)	0.007
No	78	20 (25.6)	
Rural experience is essential for all medical personnel			
Yes	58	24 (41.4)	0.042
No	34	7 (20.6)	
More jobs for medical personnel in rural areas			
Agreed	56	25 (44.6)	0.003
Disagreed	26	3 (11.5)	
More chances of being of service in rural areas			
Yes	56	20 (35.7)	0.076
No	29	5 (17.2)	
Salary better in rural areas			
Yes	43	18 (41.9)	0.061
No	47	11 (23.4)	
Curriculum adequately prepares students to work in rural settings			
Agreed	53	24 (45.3)	0.003
Disagreed	42	7 (16.7)	
More contact with patient in rural areas			
Agreed	70	28 (40.0)	0.016
Disagreed	19	2 (10.5)	
Better environment surrounding in rural areas			
Agreed	34	17 (50.0)	0.005
Disagreed	60	13 (21.7)	

[a] percents are factor specific

Among the students, curricula and age were the only factors that were significantly associated with the outcome in a multivariate analysis. Students at each birthday were 23% (OR=1.23, 95% CI [1.04, 1.44] p= 0.013) more likely to be willing to work in rural areas for at least 5 years. Students who were of the conviction that the curricula adequately prepared them to work in rural areas were 2.56 (95% CI [1.34, 4.88], p=0.004) times more likely to be willing to work in rural areas for at least 5 years compared to those who were of the conviction that the curricula did not prepare them to work in the rural areas.

DISCUSSION

We conducted the study to find out the factors that contributed to the willingness of health personnel to work in rural settings for at least five years. Most health workers were willing to work in rural areas for one or two years, but it was felt that this was the minimum time needed for the workers to be acquainted with the environment and understand the community. Five years was considered long enough for their services to be appreciated more by the community.

One of the findings of this study is that students who were convinced that the Zambian curricula adequately prepared them to work in rural areas were more likely to work in such areas for at least five years. However, Reid et al. [8] in which he raised a question as to whether it was right to send the new graduates to the rural areas, where they had to work alone, or in small contemporary groups, under the most trying conditions. They agued that rural medical practitioners needed to have adequate training in emergency medical care since they had considerable responsibility for providing emergency care. These doctors, therefore, needed to have extensive experience since they had to manage all conditions presented to them whether they had the appropriate skills or not, because referral was often impossible for a variety of reasons such as no transport, long distances to tertiary institutions; patient too ill to be moved or that the patient can not afford the user fees at the other end.

Another finding from the current study is that qualified and student doctors and nurses who were older were more likely to opt to work in rural areas for longer period. This differs from a finding of a study done in Zimbabwe by Siziya and Woelk [9] who did not find an association between age and working in rural areas. The different findings could be attributed to different sampled populations. Siziya and Woelk sampled qualified doctors and housemen, while the current study included nurses.

Single persons may find it difficult to find persons who they may marry in rural areas, and as a result, they may not be willing to go and work in rural areas. Incentives should also be tailored for older and married health workers so that they may consider settling in rural areas.

Our results of no significant associations between working in rural areas for at least five years and increasing opportunities for continuing education, and good schools for children contradict earlier studies done in South Africa and Ethiopia. Although qualified staff in Zambia is given education incentive for working in the rural areas for three years, this may not encourage them to work for a longer period than 3 years. Students in Kwazulu – Natal [10] and in Ethiopia [11] considered opportunities for continuing education better in urban areas. Schools for children were considered better in urban than rural areas in Ethiopia [11].

LIMITATIONS

Caution should be taken in generalizing the findings of this study beyond the sampled populations because our sample was not randomly drawn. However we have no reasons to believe that respondents who participated in our survey from the rural institutions that we sampled could be significantly different in their views towards working in rural areas. Furthermore because of the problem of small numbers, the analysis could not be stratified by profession (doctors versus nurses). Furthermore, some percents are based on denominators that are less than 30, and should be cautiously interpreted. A health facility manned by any one of these two cadres would be better off than being manned by unqualified staff.

CONCLUSIONS

As has been suggested before [3,12] there is no one single intervention that may attract health personnel to work in rural areas. A combination of factors, some of which we have identified in the current study, must be considered in the improvement of health personnel staffing levels in rural Zambia.

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