

Trends in attrition among medical teaching staff at universities in Myanmar 2009–2013

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ABSTRACT

Although lack of human resources for health is becoming a global problem, there are few studies on human resources in Myanmar. This study was conducted to investigate the attrition rates of teaching staff from universities for medical professions in Myanmar from 2009 to 2013. The data were collected from administrative records from Department of Medical Sciences, Ministry of Health, Myanmar. Numbers of staff and those who permanently left work (attrition) from 2009 to 2013 were counted. The reasons were classified into two categories; involuntary attrition (death or retirement) and voluntary attrition (resignation or absenteeism). Official records of the attrited staff were reviewed for identifying demographic characteristics. The annual attrition rate for all kinds of health workers was about 4%. Among 494 attrited staff from 2009 to 2013, 357 staff (72.3%) left their work by involuntary attrition, while 137 staff (27.7%) left voluntarily. Doctors left their work with the highest annual rate (6.7%), while the rate for nurses was the lowest (1.1%). Male staff attrited with a higher rate (4.6%) than female staff (2.7%). Staff aged 46–60 years had the highest attrition rate. PhD degree holders had the highest rate (5.9%), while basic degree holders had the second highest rate (3.5%). Associate professors and above showed the highest attrition rate (8.1%). Teaching staff from non-clinical subjects had the higher rates (8.2%). Among 494 attrited staff, significant differences between involuntary attrition and voluntary attrition were observed in age, marital status, education, overseas degree, position, field of teaching, duration of services and duration of non-residential service. These findings indicated the need to develop appropriate policies such as educational reforms, local recruitment plans, transparent regulatory and administrative measures, and professional incentives to retain the job.

Key Words: attrition, teaching staff, Department of Medical Sciences, Myanmar

INTRODUCTION

Health professionals are those with the primary intention to enhance the health of people. According to the World Health Organization (WHO) health system framework, the health workforce represents one of the key six building blocks of a health system (governance, financing, health workforce, health information, materials, and service delivery). These human resources include clinical staff such as physicians, nurses, pharmacists, dentists, and teaching staff, as well as management and supporting staff such as managers, health economists, computer operators,

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clerks, drivers and so on.¹⁻⁴⁾

Health system and service depend largely on the size, skills and commitment of the health workforce. It has been estimated that countries with fewer than 2.3 physicians, nurses and midwives per 1,000 populations generally fail to achieve adequate coverage rates for selected primary healthcare interventions, as prioritized by the Millennium Development Goals.⁵⁻⁸⁾ According to the handbook “Human Resources for Health, Overcoming the Crisis” many countries are facing human resources problems such as

1. Global shortage - There is a massive global shortage of health workers especially in Sub-Saharan countries and developing countries.
2. Skill imbalance - This creates huge inefficiencies. In some countries, the services depend too much on doctors and specialists, although the most of healthcare services could be covered by public health professionals.
3. Maldistribution - This is worsened by unplanned migration. Increased urban concentration among workers, as well as different concentrations between the public and private sectors are problems everywhere.
4. Poor work environment - This is a major cause of high attrition and health workforce migration.
5. Weak information - This hampers planning, policy development and program operations of the health workforce.⁵⁾

The WHO estimates a global shortage of almost 4.3 million physicians, midwives, nurses, and supporting workers. The shortage is most severe in 57 of the poorest countries. The situation was declared a “health workforce crisis” on World Health Day 2006, indicating the result of decades of under-investment in health worker education, training, wages, working environment, and management.¹⁾

In Myanmar, there were 0.6 doctors per 1,000 population and 1 nurse per 1,000 population in 2012. Maternal mortality rate was 460/100,000 live births in 1990s and reduced to 220/100,000 live births in 2012.⁹⁾ It is unlikely to meet the MDG of reducing these rates by three-fourths by 2015. Many analyses showed that insufficient human resources for health is one of the major causes. Production of more health workers is urgently needed.

The Department of Medical Sciences (DMS) is a government medical educational facility, one of the seven departments in the Ministry of Health, formed to train and produce all categories of human resources for health in Myanmar. There are 14 medical and allied universities and 46 nursing and midwifery schools under management of the DMS. In the head office, universities, and training schools, there are 2,025 officers and 3,054 non-officers, for a total of 5,079 staff. There are seven cadres of health workforce in the DMS. They are doctors, dental surgeons, nurses and midwives, pharmacists, medical technologists, non-medical teaching staff (sciences such as biology and chemistry) and other staff.¹⁰⁾

Although greater production of health workforce is urgently needed, universities and training schools under the DMS face staff insufficiency, high attrition and high turnover rate. Some medical education studies have shown that the standard student-teacher ratio in bedside clinical teaching is 4 students per one teacher.¹¹⁾ In Myanmar, the ratio of medical students to teacher is usually more than 20 students per one teacher. According to official records, about 5% of staff from the DMS are leaving from work annually.

Many countries face difficulties in recruiting new health staff and retaining existing ones. In health care there is a general assumption that staff turnover/attrition will negatively affect both access to care and the level and quality of healthcare being provided. Retaining and developing the workforce is generally regarded as a major human resource objective for any organization.^{12,13)} Recruiting and keeping the right staff are key challenges for health policy-makers. There is a

worldwide interest in retaining health workers. This is proved by studies on job satisfaction, absenteeism, turnover, attrition and intention to emigrate in countries with few resources.¹⁴⁻¹⁸⁾

The WHO/World Bank/USAID handbook has suggested that the “workforce loss ratio” or “attrition” can be calculated by using number of workers who have left in the last year as numerator and total number of health workers as the denominator. This handbook also noted the importance of monitoring to differentiate between “involuntary” attrition (death or retirement) and “voluntary” attrition (resignation or absenteeism).¹⁹⁾ High voluntary attrition rates indicate that poor human resources management and a poor working environment may cause high loss of a productive workforce, as well as high recruitment and training costs.²⁰⁻²⁸⁾ The most common reasons of voluntary attrition are

- Personal dissatisfaction with job, employer, hours, or working conditions, or in more severe cases, burnout.
- Factors in employees’ personal lives not related to the job which make holding or performing the job impossible or more difficult. These may include family obligations, education, health, or moving to a new location.
- Being hired at a new job. Reasons for wanting a different job may be better working conditions, better hours, a shorter distance to work, better pay, graduation, career progression or preparation for entry into a new career, or a career change.²⁹⁻³⁵⁾

Assessments of human resources for health are required for various purposes, notably for planning, implementing, monitoring and evaluating health sector strategies, programs and interventions. Precisely describing human resources for health can help to identify opportunities and constraints for scaling up health interventions. It is an unfortunate truth that countries most in need of strengthening their human resources for health tend to have the most fragmented and unreliable data and information. Most countries lack a harmonized dedicated system for collecting, processing and disseminating comprehensive timely information on their health workforce, including stock, distribution, expenditures and determinants of change.^{1,19)}

The most efficient and immediate way to track changes to a health workforce is using data from a routine administrative information system. Although lack of human resources for health is becoming a global problem, there are few studies on human resources in Myanmar. This study aimed to discover the attrition rate trends of the teaching staff from medical universities and training schools in Myanmar, where the problem was assumed to be high. The authors hope this study will lead to policy reform for better human resources for health management in Ministry of Health in Myanmar.

MATERIALS AND METHODS

This study was done by reviewing and analyzing workforce data from the administrative records of the Administrative Division and Nursing Training Division, DMS, Ministry of Health, Myanmar during August to September, 2014. The number of staff and those who permanently left work (attrition) from 2009 to 2013 was counted. Reasons were classified into two categories; involuntary attrition (death or retirement) and voluntary attrition (resignation or absenteeism). Resignation was counted when the staff member officially left the job before retirement, which meant he or she got permission from the Ministry of Health to do so. Absenteeism was counted when the staff unofficially left the work before retirement without getting permission from the Ministry of Health. Official records of the attrited staff were reviewed for identifying demographic characteristics including age, sex, marital status and education status. In the categories of doctors and dental surgeons, the study population included those from officer level, i.e., assistant lecturer

and above. For other categories such as nurses, pharmacists, medical technologists, pre-medical teaching staff, and non-officer level (demonstrators/tutors) were counted to cover all teaching staff.

Attrition rates according to professions, subjects, and universities from 2009 to 2013 were calculated. Only the 2013 dataset was complete enough and available to describe the attrition rates according to the demographic factors of the staff. Data management and analysis was done using SPSS software. Between personal characteristics and types of attrition (voluntary and involuntary) was analyzed by a chi-square test. Attrition rate as defined by the aforementioned WHO/World Bank/USAID handbook was used in this study.

Before conducting the study, ethical approval was obtained from the ethical board of the DMS, Myanmar.

RESULTS

In the DMS, there were 2,423 teaching staff in 2009, 2,670 teaching staff in 2010, 2,546 teaching staff in 2011, 2,502 teaching staff in 2012 and 2,567 teaching staff in 2013. There were 494 teaching staff who permanently left work from 2009 to 2013: 385 doctors, 25 dental surgeons, 20 nurses, 6 pharmacists, 8 medical technologists, 37 pre-medical teaching staff, and 13 administrative staff.

Table 1 shows the attrition rates of the staff from 2009 to 2013, and the overall. In 2011, the attrition rate was the highest. Compared to involuntary attrition, the voluntary attrition rate was higher throughout the 5 years. The most common causes of attrition were absenteeism, followed by resignation; in total 72.3% (near two-thirds) of the staff left the DMS voluntarily. The main cause of involuntary attrition was retirement and death.

Table 2 shows the distribution of the staff attrition by calendar years. There were statistically significant differences in the distribution of age group and education level of the attrited staff among the calendar years ($p < 0.001$ and $p < 0.05$, respectively). There were no statistically significant differences in the distribution of gender and overseas degree of the attrited staff.

Table 3 shows attrition rates according to gender of the DMS staff in 2013. It also highlights the attrition rates changes to demographic factors of the staff. Only the attrition rates for demographic factors in 2013 were calculated because the numbers of staff from the DMS of these subgroups were not available for the other years. In 2013, male staff showed a significantly higher ($p < 0.05$) attrition rate (4.6%) than female staff (2.7%). Those aged 46–60 years had the

Table 1 Attrition rate of the staff from Department of Medical Sciences in 2009–2013

Year	Total staff	Attrited staff					
		Voluntary attrition ^{a)}		Involuntary attrition ^{b)}		Total	
		N	%	N	%	N	%
2009	2,423	83	3.4	15	0.6	98	4.0
2010	2,670	84	3.1	25	0.9	109	4.1
2011	2,546	79	3.1	27	1.1	106	4.2
2012	2,502	61	2.4	41	1.6	102	4.1
2013	2,567	50	1.9	29	1.1	79	3.1
Total	12,708	357	2.8	137	1.1	494	3.9

a) Attrition due to resignation and absenteeism

b) Attrition due to death and retirement

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highest attrition rate (8.8% in males and 4.8% in females) when compared with different age groups ($p < 0.001$ in either gender). Regarding education, PhD degree holders had the highest rate among female staff, but not among male staff. The difference in the attrition rate between staff with overseas degrees and the others was not significant.

Table 2 Attrition rate among the staff of Department of Medical Sciences in 2009–2013

Variables	2009 N=98		2010 N=109		2011 N=106		2012 N=102		2013 N=79		<i>p</i> -value ^{a)}
	N	%	N	%	N	%	N	%	N	%	
Age											<0.001
< 30 years	34	34.7	13	11.9	13	12.3	11	10.8	7	8.9	
31–45 years	41	41.8	65	59.6	61	57.5	48	47.0	42	53.2	
46–60 years	23	23.5	31	28.4	32	30.2	43	42.2	30	38.0	
Gender											0.968
Male	30	30.6	30	27.5	33	31.1	32	31.4	25	31.6	
Female	68	69.4	79	72.5	73	68.9	70	68.6	54	68.4	
Education											< 0.05
Bachelor degree	57	58.2	44	40.4	46	43.4	36	35.3	28	35.4	
Master degree	30	30.6	54	49.5	45	42.5	55	53.9	38	48.1	
PhD degree	11	11.2	11	10.1	15	14.2	11	10.8	13	16.5	
Oversea degree											0.727
Yes	10	89.8	6	94.5	10	90.6	10	90.2	6	92.4	
No	88	10.2	103	5.5	96	9.4	92	9.8	73	7.6	

a) *p*-values are from a chi-square test

Table 3 Attrition rate among the staff of Department of Medical Sciences according to gender in 2013

Variables	Male			Female			Total		
	N	%	<i>p</i> -value ^{a)}	N	%	<i>p</i> -value ^{a)}	N	%	<i>p</i> -value ^{a,b)}
Total	25/546	4.6		54/2,021	2.7		79/2,567	3.1	< 0.05
Age			<0.001			< 0.001			< 0.001
< 30 years	2/196	1.0		5/733	0.7		7/929	0.8	
31–45 years	13/236	5.5		29/872	3.3		42/1,108	3.4	
46–60 years	10/114	8.8		20/416	4.8		30/530	5.8	
Education			0.268			< 0.05			< 0.05
Bachelor degree	11/172	6.4		17/637	2.7		28/809	3.5	
Master degree	11/325	3.4		27/1,212	2.2		38/1,537	2.5	
PhD degree	3/49	6.1		10/172	5.8		13/221	5.9	
Oversea degree			0.163			0.217			0.841
Yes	4/46	8.7		2/167	1.2		6/213	2.8	
No	21/500	4.2		21/854	2.8		73/2,354	3.1	

a) *p*-values are from a chi-square test.

b) Comparison between both genders.

Table 4 Attrition rate according to position and type of the staff from Department of Medical Sciences in 2009–2013

Variables	2009		2010		2011		2012		2013	
	N	%	N	%	N	%	N	%	N	%
Total	98/2,423	4.0	109/2,670	4.1	106/2,546	4.2	102/2,502	4.1	79/2,567	3.1
Position										
Demonstrator	13/645	2.0	11/701	1.6	6/682	0.9	6/664	1.0	4/668	0.6
Assistant lecturer	58/1,023	5.7	61/1,109	5.5	64/1,053	6.1	53/1,037	5.1	39/1,067	3.7
Lecturer	13/527	2.5	17/589	2.9	10/541	1.8	19/545	3.5	17/552	3.1
AP ^{a)} and above	14/228	6.1	20/271	7.4	26/270	9.6	24/256	9.3	19/280	6.7
Salary										
<150,000 Kyats	13/645	2.0	11/701	1.6	6/682	0.9	6/664	1.0	4/668	0.6
150,000 Kyats	58/1,023	5.7	61/1,109	5.5	64/1,053	6.1	53/1,037	5.1	39/1,067	3.7
170,000 Kyats	13/527	2.5	17/589	2.9	10/541	1.8	19/545	3.5	17/552	3.1
>190,000 Kyats	14/228	6.1	20/271	7.4	26/270	9.6	24/256	9.3	19/280	6.7
Profession										
Doctor	71/1,106	6.4	84/1,204	6.9	92/1,167	7.9	81/1,146	7.1	57/1,148	4.9
Dentist	7/140	5.0	5/171	2.9	6/157	3.8	5/151	3.3	2/165	1.2
Nurse	3/329	0.9	5/402	1.2	1/378	0.3	4/370	1.1	7/379	1.8
Pharmacist	4/65	6.1	1/60	1.7	0/52	0.0	0/49	0.0	1/57	1.8
Medical technologist	5/70	7.1	2/63	3.2	0/53	0.0	0/52	0.0	1/60	1.7
Non-medical teaching staff	8/662	1.2	8/708	1.1	5/687	0.7	8/678	1.2	8/680	1.2
Administrative staff	0/51	0.0	4/62	6.4	2/52	3.8	4/56	7.1	3/78	3.8

a) Associate professor

Table 4 shows the attrition rate according to the position, salary, and profession. Associate professors and above showed the highest attrition rate, especially in 2011 (9.6%), while demonstrators had the lowest (1.2%). Those with salary more than 190,000 Kyats (190 USD) showed the highest rate, while those with salary less than 150,000 Kyats (150 USD) showed the lowest rate. Concerning the type of staff, doctors left work in the highest rate about average (6.7%) between 2009 and 2013, while nurses had the lowest rate (1.1%). Since doctors had left work in the highest rate, the attrition rates of the doctors for a span of 5 years were calculated and shown in Figure 1. The attrition rate of the doctors was highest in 2011. In 2013, the trend decreased but the voluntary attrition rates were still high.

Table 5 shows the attrition rate according to universities and subjects. The University of Public Health had the highest rate (8.8%), while the University of Medicine I had the second highest rate (5.6%). Regarding subjects, staff who taught non-clinical subjects left work at the highest rate (8.2%).

Table 6 shows the demographic factors of attrited staff from 2009 to 2013 in types of attrition (voluntary attrition and involuntary attrition). While 357 (72.3%) staff left work voluntarily, 137 (27.7%) staff left involuntarily. Apart from permanent address and universities, there were significant differences in the distribution of age, sex, marital status, education, oversea degree, profession, position, subject, duration of service and duration of non-residential service among types of attrition ($p < 0.001$ by a chi-square test).

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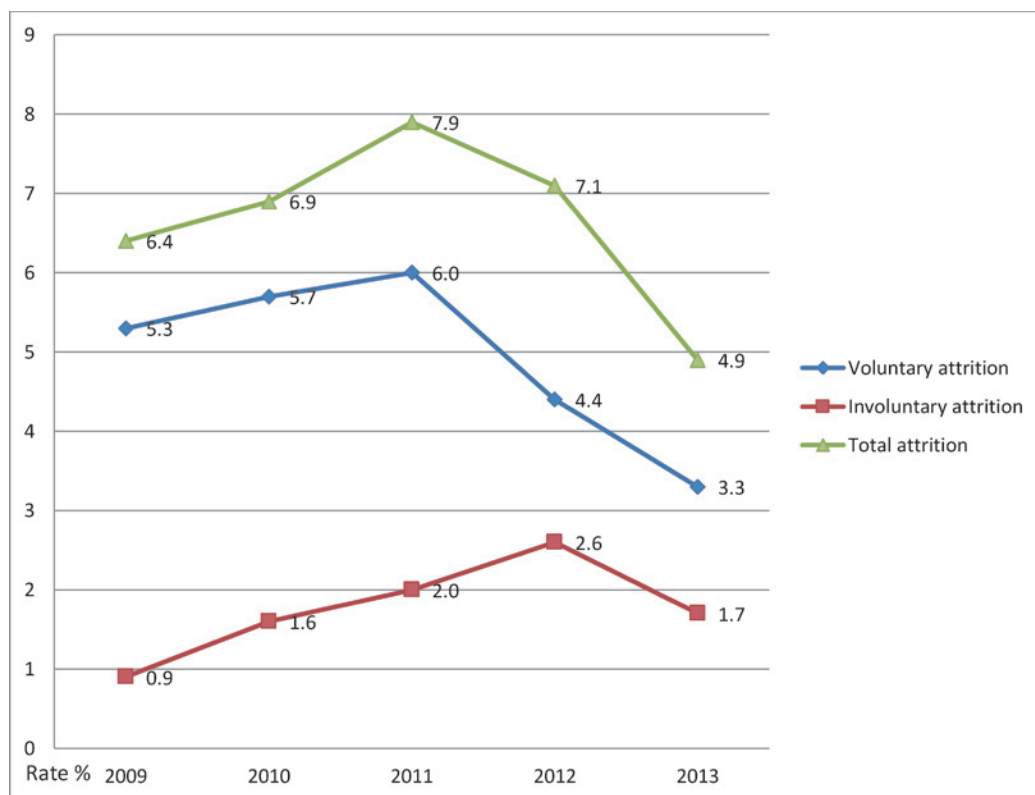


Fig. 1 Attrition rate of doctors from Department of Medical Sciences in 2009–2013
 Voluntary attrition – attrition due to resignation and absenteeism
 Involuntary attrition – attrition due to death and retirement

Table 5 Attrition rate according to universities and subjects of the staff from Department of Medical Sciences in 2009–2013

Variables	2009		2010		2011		2012		2013	
	N	%	N	%	N	%	N	%	N	%
Total	98/2,423	4.0	109/2,670	4.1	106/2,546	4.2	102/2,502	4.1	79/2,567	3.1
Universities										
UM ^{a)} I	24/397	6.0	30/413	7.3	24/402	6.0	16/399	4.0	19/407	4.7
UM ^{a)} II	15/385	3.9	25/400	6.3	19/390	4.9	22/389	5.7	12/394	3.0
UM ^{a)} Mandalay	10/368	2.7	13/384	3.4	18/381	4.7	21/372	5.6	13/377	3.4
UM ^{a)} Magway	24/225	10.6	9/243	3.7	2/234	0.9	5/232	2.2	6/234	2.6
UD ^{b)} Yangon	5/130	3.8	7/148	4.7	11/140	7.6	8/137	5.8	5/140	3.6
UD ^{b)} Mandalay	1/97	1.0	1/112	1.0	4/104	3.8	4/101	3.9	2/106	1.9
UN ^{c)} Yangon	2/140	1.4	5/152	3.3	5/148	3.4	2/144	1.4	3/150	2.0
UN ^{c)} Mandalay	0/102	0.0	3/117	2.6	0/109	0.0	2/106	1.9	2/111	1.8
UP ^{d)} Yangon	5/61	8.2	1/74	1.4	3/68	4.4	2/65	3.1	3/70	4.3
UP ^{d)} Mandalay	2/52	3.8	3/67	4.5	0/59	0.0	2/57	3.5	0/61	0.0

UMT ^{b)} Yangon	1/72	1.4	2/86	2.3	7/80	8.8	3/77	3.9	1/81	1.2
UMT ^{b)} Mandalay	5/70	7.1	1/81	1.2	2/76	2.6	4/73	5.5	1/78	1.3
UPH ^{g)}	0/20	0.0	1/27	3.7	5/23	21.7	3/21	14.3	1/24	4.2
UCH ^{g)}	1/52	1.9	1/71	1.4	1/60	1.7	2/58	3.4	4/62	6.5
MEU ^{h)} and DMS ⁱ⁾	1/63	1.6	5/80	6.3	4/73	5.5	2/73	2.7	3/75	4.0
N and MW ^{j)}	2/191	1.0	2/215	0.9	1/199	0.5	4/198	2.0	4/197	2.0
Subjects										
Pre-medical	7/660	1.1	8/722	1.1	5/694	0.7	8/680	1.2	8/697	1.1
Non-clinical	59/688	8.6	60/750	8.0	75/718	10.4	59/719	8.2	43/722	5.9
Clinical	29/393	7.4	32/455	7.0	23/423	5.4	28/402	6.9	20/430	4.7
Other	3/682	0.4	9/743	1.2	3/711	0.4	7/701	1.0	8/718	1.1
a) University of Medicine			f) University of Public Health							
b) University of Dental			g) University of Community Health							
c) University of Nursing			h) Medical Education Unit							
d) University of Pharmacy			i) Department of Medical Sciences							
e) University of Medical Technology			j) Nursing and Midwifery Schools							

Table 6 Demographic characteristics of the attrited staff from Department of Medical Sciences in 2009 – 2013 (N=494)

Variables	Voluntary attrition ^{a)}		Involuntary attrition ^{b)}		<i>p</i> -value ^{c)}
	(N=357)		(N=137)		
	N	%	N	%	
Age					<0.001
Less than 30 years	78	100.0	0	0.0	
31–45 years	251	97.7	6	2.3	
46–60 years	28	17.6	131	82.4	
Sex					<0.001
Male	84	56.0	66	44.0	
Female	273	79.4	71	20.6	
Marital Status					<0.001
Single	174	82.1	38	17.9	
Married	183	64.9	99	35.1	
Education					<0.001
Bachelor degree	191	90.5	20	9.5	
Master degree	150	67.6	72	32.4	
PhD degree	16	26.2	45	73.8	
Oversea degree					<0.001
Yes	16	38.1	26	61.9	
No	341	75.4	111	24.6	
Profession					<0.001
Doctor	285	74.0	100	26.0	
Dental surgeon	17	68.0	8	32.0	

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Nurse	16	80.0	4	20.0	
Pharmacist	5	83.8	1	16.7	
Medical technologist	7	87.5	1	12.5	
Non-medical teaching staff	27	73.0	10	27.0	
Administrative staff	0	0.0	13	100.0	
Position					<0.001
Demonstrator	35	87.5	5	12.5	
Assistant lecture (basic degree holder)	171	97.2	3	2.8	
Assistant lecture (master degree holder)	91	91.9	8	8.1	
Lecturer	47	61.8	29	38.2	
Associate professor and above	13	12.6	90	87.4	
Permanent address					0.066
Yangon	247	73.1	91	26.9	
Mandalay	63	64.3	35	35.7	
Other	47	81.0	11	19.0	
Universities					0.159
Yangon	219	72.0	85	28.0	
Mandalay	79	69.3	35	30.7	
Magway	46	83.6	9	16.4	
Others	13	61.9	8	38.1	
Subject					<0.001
Pre-medical	26	72.2	10	27.8	
Non-clinical	247	83.4	49	16.6	
Clinical	80	60.6	52	39.4	
Others	4	13.3	26	86.7	
Duration of service					<0.001
Less than 5 year	124	99.2	1	0.8	
6–15 year	200	96.6	7	3.4	
16–30 year	33	38.8	52	61.2	
More than 31 year	0	0.0	77	100.0	
Duration of non-residential service					<0.001
No duration	245	92.1	21	7.9	
< 10 years	87	61.7	54	38.3	
11– 20 years	19	30.2	44	69.8	
21– 30 years	3	17.6	14	82.4	
>31 years	3	42.9	4	57.1	

a) Attrition due to resignation and absenteeism

b) Attrition due to death and retirement

c) *p*-values are from a chi-square test

DISCUSSION

This study focused on officer level for doctors and dental surgeons but in some categories of workforce such as nurses, pharmacists, medical technologists and pre-medical teaching staff, the demonstrator/tutor level was also included to get relevant data. As a result, the study is largely representative of all the teaching staff in the DMS. From 2009 to 2013, overall staff attrition rate of the DMS was about 4% yearly; voluntary attrition (resignation and absenteeism), was nearly two-thirds of this attrition. Although the overall attrition rate was not too high for an organization, high voluntary attrition showed poor human resources management. Most human resources studies have shown high voluntary attrition in the public sector, especially in developing countries. There are various factors that lead to migration and brain drain from the public sector to the private sector or foreign countries. These underlying causes can be characterized as push factors (poor working condition, low salary, lack of incentive, and so on) and the opposite, pull factors.^{3,8,14,19,35)}

Among the cadres of the DMS health workforce, doctors were most the attrited, both voluntarily and involuntarily, with about 80% of the attrition and an average rate of 6.6% yearly. This condition is the same as most human resources for health problems all over the world. It causes imbalance in cost effective benefits of the health budget of many countries because the cost of producing doctors is higher compared to the production of other cadres of health workers. This is shown by various studies from all over the world.^{3,5,19,24)} Among doctors, teaching staff in non-clinical subjects had the highest attrition rate. Medical technologists and pharmacists only attrited voluntarily. Other staff, such as administrative staff and librarians, left their work involuntarily. The attrition rate of nurses was low, unlike in other studies from developing countries, where nurses were highly attrited.^{15,17,23,26,36)} In Myanmar, most of the nursing training schools are located across the country, not only in major cities but also in some smaller cities. Most of them can learn and serve in their own places and they did not need to leave their families. So the attrition rate of the nurse is smaller comparing to other staff.

Yangon and Mandalay are urban areas in Myanmar and universities from Yangon, such as the University of Medicine I, the University of Medicine II, the University of Public Health and the University of Pharmacy, had the highest attrition rates. The University of Medicine, Mandalay had the second highest attrition rate. Before this study, universities from Magway were considered likely to have high attrition rates and universities from Yangon to have low rates. However, the results unexpectedly showed the opposite. This might be due to the current transfer policy that teaching staff have to rotate to all universities every 2–3 years. Most of the staff from Yangon did not want to move to non-resident areas. After being assigned to new posts in other cities (i.e. after getting a transfer order) they left the work voluntarily without official release from the old post. They were still acting as staff from the old department. Accordingly, universities from Yangon and Mandalay had high attrition rates compared to those from Magway. This problem occurs in both developed and developing countries; most health workers do not want to work in non-urban areas, leading to geographical maldistribution. There may be various underlying reasons for this, such as economic problems, personal background, organizational environment, and emigration phenomena.^{19,37)}

Regarding the attrition rate among subjects, non-clinical subjects (such as anatomy, physiology and biochemistry) were the highest while the clinical subjects showed second highest attrition rate. In the DMS, most of the teaching staff are non-clinicians. This might be due to non-clinicians having fewer chances than clinicians to supplement their income with general practice after working hours, while their base salaries are not enough for a living. This causes high attrition as in other developing countries.^{8,28,37-39)} Non-clinical subjects are also known as basic science

subjects and in need of human resources for health in medical universities in Myanmar. Faculty development for those subjects is becoming a critical issue.⁴⁰⁾

Male staff had a higher attrition rate compared to female staff. With the new recruitment policy, medical and allied universities accept more male applicants with lower scores in their matriculation examinations, compared to female applicants. Although this policy has been applied since the early 2000s, the attrition of male staff was still high. This finding is different from many other studies which suggested that more female health workers leave their jobs than male workers.⁴¹⁻⁴³⁾ In Myanmar, husbands are traditionally main responsible for supporting the family and government salaries are clearly not enough to survive. So they have to quit the government job and move to the non-government sectors such as NGOs, INGOs and going abroad where they can earn much more. Moreover most of Myanmar women are willing to work after marriage to lessen the financial burden and they can choose their career as they like because of fewer cultural restrictions, unlike in some South Asian countries.

With regards to age group, the 46 to 60 years age group was the most attrited. This group was considered the most experienced staff in the DMS and the high attrition shows succession plans are urgently needed. This is a typical finding of poor long term human resources for health plans in most developing countries.^{1,19)}

Regarding education of staff, more staff with a PhD degree left their jobs than others. This finding is unlike other studies that showed younger and better educated employees are more likely to leave their jobs to seek career advancement. This particularly happens if there are limited career opportunities within the organization.⁴³⁾ It might be due to more attractive posts for qualified staff from non-government sectors and foreign countries; it seems not only financial but also non-financial incentives are required to develop in public sector.³⁷⁻³⁹⁾ Staff attitudes are important and it is necessary to motivate them. Staff with overseas degrees were less attrited compared to those without. This was not true of clinicians, most of whom were not willing to return to Myanmar after attaining their degree. Programs for recruiting more qualified teaching staff and faculty members are required, especially for non-clinical subjects.

The most attrited staff were associate professors and above while assistant lecturers were second highest. For an organization, high mid-level staff attrition highlights that there might be many impending issues such as succession problems, replacement problems and loss of skilled staff as shown in many studies.¹⁾ Succession problems occurred when there were lack of skilled staff for succession planning, i.e., a process whereby an organization ensures that employees are recruited and developed to fill each key role within the organization and it is a long term human resources planning. Replacement planning is the primary component of succession planning and, at its simplest, is an identification of employees who may potentially be able to fill positions as they become vacant. If there are not enough human resources, replacement problems will occur.

Among 494 attrited staff from the DMS from 2009 to 2013, 357 staff had left their work voluntarily (resignation and absenteeism), while 137 staff left involuntarily (retirement and death). Involuntary attrition was counted as not attrited because the staff had worked until retirement. By comparing involuntary and voluntary attrition in personal characteristics of the staff, most variables were statistically different with $p < 0.001$, except for the two variables of universities where the staff were working, and the permanent addresses of staff.

According to these findings, there were significant differences in the distribution of age, sex, marital status, education, oversea degree, profession, position, subject, duration of service, and duration of non-residential service among types of attrition. Regarding non-residential working service, most of the staff who never left their residence left the work voluntarily, making up 92% of the voluntary attrition. This might be due to an unwillingness of staff to work in non-residential areas and changes in attitude concerning this factor. This finding is similar to some

studies from developing countries showing that many staff from remote areas leave their jobs, especially in the public sector.^{36,37,39)} This should be considered an important issue in recruiting more new staff and creating training programs. Recruitment policy should be based not only on matriculation examination scores but also on rural/local residence, so as to get more staff from remote areas.^{37,43)}

In conclusion, the evidence from this study highlighted the need to develop appropriate policies such as educational reforms, local recruitment plans, transparent regulatory and administrative measures, and proper financial and professional incentives to reduce voluntary attrition. High attrition at the associate professor level and above showed that plans for succession and long-term human resources for health are needed. This study can be an initial step for further studies, such as qualitative studies to get more information, and to understand the underlying issues for better human resources management. Moreover, this study showed an inclusive and updated data base for human resources for health is urgently needed to set the evidence based policies and plans.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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