主論文の要旨

Sickness absence among employees of healthcare organizations in the public sector in Mongolia: A cross-sectional study

モンゴルの公立医療機関における従業員の病気欠勤について： 横断的研究

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【**Introduction**】

Sickness absence (SA) is one of the main concerns related to human resource management. Health facilities are a high-risk environment for healthcare workers (HCWs) to have infections and other diseases because of tough working conditions This study aimed to understand the rate of SA among employees of public healthcare organizations in Mongolia, to identify factors associated with long-term SA, and to estimate costs due to SA.

【**Methods**】

This cross-sectional study included employees of 282 facilities (193 healthcare organizations in the public sector and 89 family health centers) who had certified SA from 2016 to 2018. SA is based on the sick leave certificates issued by doctors and compensation for sick leave is 50-75% of the wage, which is decided by years in employment. Socio-demographic factors and occupational characteristics of absentees and the data of absences were collected. A logistic regression analysis was performed to identify factors associated with long-term SA (≥15 days) among employees who had SA. Absence parameters (Appendix) and the average costs due to SA were calculated. The total cost due to SA at all public healthcare organizations was estimated. This study was approved by the Ethics Committee of the Ministry of Health, Mongolia (approval number 277).

【**Results**】

From 2016 to 2018, there were 13,653 absentees and 21,043 SA with a total 202,716 absence days (Table 1). The number of absentees accounted for 19.7-21.5% of the total number of employees. The AR was 0.9% and the absence FR was 31.8% during the three years. The average length of absence was 9.63 days, the average absence length per absentee was 14.85 days, the average absence length per employee was 3.06 days, and the average frequency was 1.54. There were no differences of each absence parameter in the three years.

Of the total 21,043 absences, the most common diagnosis was diseases of the genitourinary system (n=3,436), followed by disease of the digestive system (n=2,421), diseases of the circulatory system (n=2,381), injury, poisoning and certain other consequences of external causes (n=2,283), and diseases of the nervous system (n=1,991) (Table 2).

Most absentees were females (89.6%), 39 years old or younger (45.8%), married (82.7%), having children (91.6%), and living at their own house or apartment (63.5%) (Table 3). In terms of occupational factors, most absentees were nurse/midwife/feldsher (40.2%), worked for the secondary level of healthcare organizations (52.6%), had nine years or less in employment (42.8%), and had night shift (52.3%). Of all absentees, 4,453 absentees (32.6%) repeated SA within a year. The characteristics of absentees in each year were almost the same.

Of 13,653 absentees, 3,809 absentees (27.9%) had 15 absence days or more in a year. In multivariate analysis including all socio-demographic and work-related variables, the age

groups of 40-49 years old (OR=1.17, 95% CI 1.04-1.31) and 50 years old or older (OR=1.30, 95% CI 1.12-1.49), working for the secondary level (OR=1.15, 95% CI 1.02-1.30) and the tertiary level (OR=1.31, 95% CI 1.15-1.49) of healthcare organizations, 10-19 years in employment (OR=1.14, 95% CI 1.02-1.27) and night shift (OR=1.13, 95% CI 1.04-1.23) were significantly associated with having long-term SA.

Estimation of costs of absenteeism among HCWs at all the 282 healthcare organizations from 2016 to 2018 showed that the average lost salary was 34.7 USD, the average lost productivity was 129.8 USD, the average compensation was 130.9 USD, and the total average cost was 295.5 USD (Table 5). The estimated total cost at all 653 healthcare organizations in the public sector per year was 1,796,993 USD including total lost productivity (789,238 USD), total lost salary (210,099 USD), and total compensation (795,767 USD) (Table 5).

【Discussion】

In this study, the AR of HCWs in the public sector in Mongolia was 0.9%, which was lower compared to that in other countries. Previous studies demonstrated that the AR of HCWs was different depending on countries and kinds of professionals. The reasons for the lower AR in this study may be due to the regulations on medically certified SA and low compensation. A shortage of nursing staff may also contribute to the low AR because nurses may feel pressure to work and therefore may not take SA.

The top three causes of SA among HCWs were diseases of the genitourinary system, the digestive system, and the circulatory system, which were common diseases in Mongolian population. The fifth common cause of SA among HCWs was diseases of the nervous system, which may be caused due to stress by heavy workload or anxiety related to their work. Mongolian HCWs might have uncertified SA or work when they had minor respiratory diseases such as acute respiratory illness or influenza-like illness.

Factors associated with taking a long-term absence among HCWs who had SA were the age group ≥40 years old, 10-19 years in employment compared to 9 years or less, working at the secondary and tertiary levels compared to the primary level, and having night shifts. Younger workers have fewer chronic diseases, can recover from illness and injury earlier, and are more likely to have absences due to minor health problems or motivational issues compared to older workers. Shift work negatively affects an employee's health and can increase the risk of cardiovascular diseases, gastrointestinal disorders, and cancer. HCWs of organizations in the secondary or tertiary level might be more exposed to physical and mental stress and have low group cohesiveness. To reduce and manage long-term SA, especially at large healthcare organizations, increasing the motivation of HCWs to return to their work by early intervention by trained managers and robust implementation of SA policies are recommended.

The total cost due to SA in the public sector was estimated to be 1,796,993 USD per year, which accounted for 0.8% of the average annual expenditure of all healthcare organizations in

the public sector (222,615,514 USD). The results of this study showed that the absenteeism cost at health organizations in the public sector are substantial, although the AR was low. According to the Labor Law, the working hours should be reduced when employees are diagnosed with occupational diseases or have an industrial accident but not general diseases based on the decision of Occupational Health Center. Policy makers should evaluate the policy and regulations related to SA to make sure healthy life of HCWs in Mongolia.

There are some limitations to this study. First, this study included only medically certified SA but not non-certified SA or short-term SA for 1-3 days. Second, this study did not include all healthcare organizations in the public sector, because the response rate was 43.2%. Third, this study included only HCWs who had SA in 2016-2018 but did not include all HCWs.

【**Conclusions**】

The AR of HCWs in the public sector was 0.9% and the most common cause of certified SA was diseases of the genitourinary system. Factors associated with taking a long-term SA among HCWs who had SA were 40 years old or older, 10-19 years in employment compared to 9 years or shorter, higher organizational level, and having night shifts. The average total cost per absentee was estimated to be 295.5 USD and the total cost due to SA in the public sector was estimated to be 1,796,993 USD per year. To reduce costs due to SA and promote the well-being and health of HCWs, policy makers should review the policy and regulations related to SA and develop national guidelines about SA for employers, healthcare managers, and absent HCWs in Mongolia.

Table 1 Parameters of sickness absences at 282 healthcare organizations from 2016 to 2018

Variables	2016	2017	2018	Total
Total number of employees	21,285	22,115	22,828	66,228
Available workdays (days)	247	249	252	748
Total available workdays of all employees (days)	5,257,395	5, 506,635	5,752,656	16,516,686
Number of absentees (%)	4,195 (19.7%)	4,745 (21.5%)	4,713 (20.6%)	13,653 (20.6%)
Number of absences	6,320	7,356	7,367	21,043
Total absence days	61,050	70,402	71,264	202,716
Absence rate (%)	0.8	0.9	0.9	0.9
Absence frequency rate (%)	29.7	33.3	32.3	31.8
Average absence length (days) [95% CI]	9.66 [9.50-9.82]	9.57 [9.44-9.71]	9.67 [9.54-9.82]	9.63 [9.55-9.71]
Average absence length per absentee (days) [95% CI]	14.55 [14.13-15.03]	14.84 [14.39-15.28]	15.12 [14.65-15.59]	14.85 [14.60-15.10]
Average absence length per employee (days) [95% CI]	2.87 [2.85-2.89]	3.18 [3.16-3.21]	3.12 [3.10-3.14]	3.06 [3.05-3.07]
Average frequency of absences per absentee [95% CI]	1.51 [1.48-1.54]	1.55 [1.52-1.58)	1.56 [1.53-1.59]	1.54 [1.52-1.56]

CI, confidence interval.

Table 2 The absence frequency and the average length of absence according to top 10 ICD-10 diagnostic categories from 2016 to 2018 (n=21,043)

ICD-10 diagnostic category	Absence n (%)	Average absence length (days) [95% CI]
Diseases of the genitourinary system	3,436 (16.3%)	8.71 [8.58-8.86]
Diseases of the digestive system	2,421 (11.5%)	8.53 [8.34-8.73]
Diseases of the circulatory system	2,381 (11.3%)	9.07 [8.88-9.28]
Injury, poisoning and certain other consequences of external causes	2,283 (10.8%)	13.55 [13.19-13.93]
Diseases of the nervous system	1,991 (9.5%)	8.97 [8.77-9.17]
Diseases of the respiratory system	1,726 (8.2%)	7.58 [7.39-7.78]
Diseases of the musculoskeletal system and connective tissue	1,232 (5.9%)	9.31 [9.04-9.59]
Neoplasms	937 (4.5%)	14.05 [13.53-14.56]
Certain infectious and parasitic disease	720 (3.4%)	12.89 [12.21-13.70]
Diseases of the skin and subcutaneous tissue	609 (2.9%)	8.72 [8.38-9.09]

ICD-10, International Classification of Diseases 10th Revision; CI, confidence interval.

Table 3 Socio-demographic and occupational characteristics of absentees (n=13,653)

Variables	2016 (n=4,195)	2017 (n=4,745)	2018 (n=4,713)	Total (n=13,653)
	n (%)	n (%)	n (%)	n (%)
Gender				
Male	453 (10.8)	488 (10.3)	475 (10.1)	1,416 (10.4)
Female	3,742 (89.2)	4,257 (89.7)	4,238 (89.9)	12,237 (89.6)
Age group (years old)				
≤39	1,929 (46.0)	2,118 (44.6)	2,211 (46.9)	6,258 (45.8)
40-49	1,401 (33.4)	1,545 (32.6)	1,436 (30.5)	4,382 (32.1)
50≤	865 (20.6)	1,082 (22.8)	1,066 (22.6)	3,013 (22.1)
Marital status				
Single/divorced	777 (18.5)	782 (16.5)	804 (17.1)	2,363 (17.3)
Married	3,418 (81.5)	3,963 (83.5)	3,909 (82.9)	11,290 (82.7)
Number of children				
0	304 (7.2)	403 (8.5)	444 (9.4)	1,151 (8.4)
1-2	2,708 (64.6)	2,968 (62.2)	2,993 (63.5)	8,669 (63.5)
3≤	1,183 (28.2)	1,374 (29.0)	1,276 (27.1)	3,833 (28.1)
Housing type				
Own house/apartment	2,688 (64.1)	3,038 (64.0)	2,948 (62.6)	8,674 (63.5)
Rental/dormitory	234 (5.6)	251 (5.3)	247 (5.2)	732 (5.4)
Traditional ger	1,273 (30.3)	1,456 (30.7)	1,518 (32.2)	4,247 (31.1)
Occupation				
Nurse/midwife/feldsher	1,690 (40.3)	1,887 (39.8)	1,910 (40.5)	5,487 (40.2)
Other medical	1,275 (30.4)	1,463 (30.8)	1,431 (30.4)	4,169 (30.5)
Non-medical/director/ manager	1,230 (29.3)	1,395 (29.4)	1,372 (29.1)	3,997 (29.3)
Level of health organization				
Primary	564 (13.4)	660 (13.9)	646 (13.7)	1,870 (13.7)
Secondary	2,179 (52.0)	2,466 (52.0)	2,540 (53.9)	7,185 (52.6)
Tertiary	1,363 (32.5)	1,525 (32.1)	1,435 (30.4)	4,323 (31.7)
Health department	89 (2.1)	94 (2.0)	92 (2.0)	275 (2.0)
Years in employment (years)				
≤9	1,757 (41.9)	1,979 (41.7)	2,107(44.7)	5,843 (42.8)
10-19	1,028 (24.5)	1,155 (24.3)	1,168 (24.8)	3,351 (24.5)
20≤	1,410 (33.6)	1,611 (34.0)	1,438 (30.5)	4,459 (32.7)
Night shift				
No	1,964 (46.8)	2,316 (48.8)	2,237 (47.5)	6,517 (47.7)
Yes	2,231 (53.2)	2,429 (51.2)	2,476 (52.5)	7,136 (52.3)
Repeat of sickness absence				
No	2,883 (68.7)	3,214 (67.7)	3,103 (65.8)	9,200 (67.4)
Yes	1,312 (31.3)	1,531 (32.3)	1,610 (34.2)	4,453 (32.6)

Table 4 Factors associated with having long-term sickness absences (n=13,653)

Variables	Short-term n (%)	Long-term n (%)	OR (95% CI)	AOR[†] (95% CI)
Gender				
Male	1,029 (72.7)	387 (27.3)	1 (Reference)	1 (Reference)
Female	8,815 (72.0)	3,422 (28.0)	1.03 (0.91-1.17)	1.02 (0.89-1.15)
Age group (years old)				
≤39	4,690 (74.9)	1,568 (25.1)	1 (Reference)	1 (Reference)
40-49	3,090 (70.5)	1,292 (29.5)	1.25 (1.15-1.36)***	1.17 (1.04-1.31)*
50≤	2,064 (68.5)	949 (31.5)	1.37 (1.25-1.51)***	1.30 (1.12-1.49)***
Marital status				
Single/divorced	1,713 (72.5)	650 (27.5)	1 (Reference)	1 (Reference)
Married	8,131 (72.0)	3,159 (28.0)	1.02 (0.93-1.13)	1.02 (0.91-1.13)
Number of children				
0	857 (74.5)	294 (25.5)	1 (Reference)	1 (Reference)
1-2	6,231 (71.9)	2,438 (28.1)	1.14 (0.99-1.31)	1.00 (0.85-1.16)
3≤	2,756 (71.9)	1,077 (28.1)	1.14 (0.98-1.32)	0.93 (0.78-1.10)
Housing type				
Own house/apartment	6,233 (71.9)	2,441 (28.1)	1 (Reference)	1 (Reference)
Rental/dormitory	546 (74.6)	186 (25.4)	0.87 (0.73-1.03)	0.91 (0.77-1.09)
Traditional ger	3,065 (72.2)	1,182 (27.8)	0.98 (0.91-1.07)	0.99 (0.91-1.08)
Occupation				
Nurse/midwife/feldsher	3,932 (71.7)	1,555 (28.3)	1 (Reference)	1 (Reference)
Other medical	3,091 (74.1)	1,078 (25.9)	0.88 (0.80-0.97)**	0.91 (0.83-1.00)
Non-medical/director/ manager	2,821 (70.6)	1,176 (29.4)	1.05 (0.96-1.15)	1.06 (0.97-1.17)
Level of health organization				
Primary	1,413 (75.6)	457 (24.4)	1 (Reference)	1 (Reference)
Secondary	5,214 (72.6)	1,971 (27.4)	1.17 (1.04-1.31)**	1.15 (1.02-1.30)*
Tertiary	3,013 (69.7)	1,310 (30.3)	1.34 (1.19-1.52)***	1.31 (1.15-1.49)***
Health department	204 (74.2)	71 (25.8)	1.08 (0.80-1.44)	1.16 (0.86-1.56)
Years in employment (years)				
≤9	4,383 (75.0)	1,460 (25.0)	1 (Reference)	1 (Reference)
10-19	2,373 (70.8)	978 (29.2)	1.24 (1.12-1.36)***	1.14 (1.02-1.27)*
20≤	3,088 (69.3)	1,371 (30.7)	1.33 (1.22-1.45)***	1.14 (0.99-1.30)
Night shift				
No	4,788 (73.5)	1,729 (26.5)	1 (Reference)	1 (Reference)
Yes	5,056 (70.9)	2,080 (29.1)	1.14 (1.06-1.23)**	1.13 (1.04-1.23)**

OR, odds ratio; AOR, adjusted odds ratio; CI, confidence interval.
*P<0.05, **P<0.01, ***P<0.001.
[†]Adjusted for all variables listed in the table.

Table 5 Absenteeism costs of healthcare workers from 2016 to 2018 according to the levels of healthcare organizations and areas

Level of organizations	Absentee (n)	Lost productivity (USD)		Lost salary (USD)		Compensation (USD)		Total cost (USD)	
		Total	Average‡	Total	Average‡	Total	Average‡	Total	Average‡
Total	13,653	1,772,805	129.8	473,951	34.7	1,787,470	130.9	4,034,226	295.5
Rural	5,752	682,704	118.7	178,508	31.0	700,769	121.8	1,561,981	271.6
Urban	7,901	1,090,101	138.0	295,443	37.4	1,086,701	137.5	2,472,245	312.9
Primary level									
Total	1,870	204,020	109.1	57,096	30.5	210,064	112.3	471,180	252.0
Rural	1,393	150,182	107.8	41,089	29.5	161,342	115.8	352,613	253.1
Urban	477	53,838	112.9	16,007	33.6	48,722	102.1	118,567	248.6
Secondary level									
Total	7,185	893,613	124.4	234,431	32.6	900,720	125.4	2,028,764	282.4
Rural	4,168	512,407	122.9	131,610	31.6	518,997	124.5	1,163,014	279.0
Urban	3,017	381,206	126.4	102,821	34.1	381,723	126.5	865,750	287.0
Tertiary level									
Total (urban)†	4,323	644,165	149.0	173,595	40.2	645,883	149.4	1,463,643	338.6
Health department									
Total	275	31,007	112.8	8,829	32.1	30,802	112.0	70,638	256.9
Rural	191	20,114	105.3	5,809	30.4	20,430	107.0	46,353	242.7
Urban	84	10,893	129.7	3,020	36.0	10,372	123.5	24,285	289.1
Estimation at all healthcare organizations in the public sector (per year)§									
Total	6,078.2¶	789,238	-	210,099	-	795,767	-	1,796,993	-

1USD = 2,489 Mongolian Tugriks (MNT) in 2016, 2,427 MNT in 2017, and 2,644 MNT in 2018.
†All healthcare organizations of the tertiary level located in Ulaanbaatar City.
‡Average per absentee.
§The total number of healthcare organizations including family health centers was 654 in 2016, 652 in 2017, and 653 in 2018.
¶The estimated average number of absentees per year.

Appendix Formulas for parameters of sickness absences

	Parameter	Formula
(A)	Total number of employees	
(B)	Available workdays (days)	
(C)	Total available workdays of all employees (days)	(A) x (B)
(D)	Number of absentees	
(E)	Number of absences	
(F)	Total absence days	
(G)	Absence rate (%)	((F) x 5 / 7) / (C) x 100
(H)	Absence frequency rate (%)	(E) / (A) x 100
(I)	Average absence length (days)	(F) / (E)
(J)	Average absence length per absentee (days)	(F) / (D)
(K)	Average absence length per employee (days)	(F) / (A)
(L)	Average frequency of absences per absentee	(E) / (D)