Causes of medical repatriations and mortality among Ethiopian peacekeepers in the United Nations Interim Security Force for Abyei (UNISFA) mission.

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Abstract

Introduction: Ethiopia has a long history of participation in United Nations (UN) peace operations since 1950. Currently the country is involved in large and complex peacekeeping operation in different African countries.

Objective: To assess causes of medical repatriations and mortality among Ethiopian peacekeepers in the United Nations Interim Security Force for ABYEI (UNISFA) Mission.

Method: Retrospective documents review study design was applied. From June 2011 to August 2020. The data was entered and analyzed using SPSS version 23 statistical package. Data cleaning was performed to check for accuracy, consistency and missed values. Frequencies, proportions and summary statistics were used to describe the study population in relation to relevant variables. The impact of selected socio -demographic and other characteristics of causes of medical repatriations and mortality was investigated using both the bivariate method and the multivariable logistic regression technique.

Result: The common causes of medical repatriations in UNISFA mission in Ethiopian peacekeepers were 63 (26.9%) due to Injuries, 39 (16.7%) diseases of the digestive system and 30 (12.8%) mental and behavioral disorder and the common causes of death were 38.2% due to illness, 29.4% accident, 23.5% malicious act and 3 (8.8%) others. In multi variables analysis sex, rank and past medical history were statistically significantly associated with the medical repatriation due to illness, and those who were male patients were 16 times repatriated by illness than females. (AOR=16.64; 95%CI=2.03-135.74, P=0.09), Higher rank officers 2.5 times repatriated due to illness than Non-officers (AOR=2.5; 95%CI =1.25-6.14, P=0.027) and patients who had past medical history 11 times repatriated by illness than those who do not have a past medical problems (AOR=11.14; 95% CI =5.55-22.38, P=0.00).

Conclusions: Analysis of the causes of medical repatriations and death in Ethiopian peacekeepers indicated more repatriations and death occurs by illness than accidents and malicious acts. The majority of patients who were repatriated from the mission area to their home country due to chronic illness and two-thirds of patients had past medical history. This indicated poor pre-deployment screening system and pre-existing medical condition which was aggravated by stressful mission and weather condition.

Keywords: Medical repatriation, Mortality

Abbreviations

ARCSH: Armed forced compressive specialized hospital; AMET: Aero-medical evacuation team; DNBI: Disease, none -battle injury; DPKO: Department of Peacekeeping Operations; HQ: Headquarter; MOU: Memorandum of Understanding; NCO: Noncommissioned officers; NGO: Nongovernmental Organization; OIOS: Office of Internal Oversight Services; SOTG: Special Operations Task Group; SPSS: Statistical package for social science; TCC: Troop Contributing Country; UNAMID: United Nations African Union-Hybrid Mission in DARFU; UNISFA: United Nations Interim Security Force for ABYEI.

Background Information

Peacekeeping has proven to be one of the most effective tools available to the UN to assist host countries navigate the difficult path from conflict to peace. Peacekeeping has unique strengths, including legitimacy, burden sharing, and an ability to deploy and sustain troops and police from around the globe, integrating them with civilian peacekeepers to advance

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multidimensional mandates. UN peacekeepers provide security and the political and peace building support to help countries make the difficult, early transition from conflict to peace.

Since 1948, 71 UN operations have been carried out. As of 31 December 2020, UN peacekeeping report, 13 operations were ongoing with a total of 94,484 personnel from 121 countries including 80.574 uniformed personnel, 4386 international civilian personnel, 8221 local civilian personnel and 1303 UN volunteers.

As with all military deployments, the health of peacekeepers has a significant bearing on their effectiveness. According to casualty data from the UN DPKO 10 September 2020, nearly 3,993 peacekeeping personnel have died in service since 1948 the overwhelming majority of them have been peacekeeping troops (2841), but there also have been significant numbers of local staff (438), police (291), international civilian staff (278), military observers (90), and others (55) [1,2].

Acute and chronic diseases of peacekeepers have been significant impact on the mission which can be prevented by proper screening of pre -deployments examination and appropriate prevention mechanism. The health of peacekeepers can be affected by diseases present in the local environment (for example, malaria or dengue fever) [3].

The landscape of the mission area is flat, which favors the collection of water bodies as the result the chance of anopheles mosquito breeding is high. Malaria is known to be number one disease during and after rainy season that kills some local community members, there is high risk for Marburg virus's disease, acute watery diarrhea, meningitis and other communicable diseases. There is the probability of an outbreak. These conditions have a great implication on the health of the force.

Injuries, chronic and acute illness have been the causes of premature medical repatriation from the operation area to home countries, this result wastage of man powers and burned of the operation on the remaining personnel until the next rotation start.

Even though numerous studies are done in describing mortality, DNBI and medical support operations in Europe, the Caribbean, and the Far East there is limited information available regarding causes of repatriations, mortality rate and morbidity data of peacekeeping in Ethiopia. So, this study was carried out to find out causes, trend and mortality that causing Ethiopian peacekeeper to be repatriated back to their home country before the mission end. On other hand it will be helping in strengthening proper pre-deployment medical examination of troops, reduced manpower wastage and planning of medical support for causes of medical repatriations and mortality.

Materials and Methods

Study area and period

The Abyei Area covers 4,000 square miles of desert, farmland, and oil fields located along the ill-defined border between Sudan and South Sudan. The Sudan's are hot with seasonal rainfall influenced by the annual shift of the Inter-Tropical Convergence Zone; rainfall is heaviest in the upland areas of the south and diminishes to the north. The White Nile, flowing north out of the uplands of Central Africa, is the major geographic feature of the countries, supporting agriculture and extensive wild animal populations. The Abyei Area Administration was established on 31 August 2008, permitting its citizens to be simultaneously members of the states of South Kurdufan (Republic of the Sudan) and Northern Bahr el Ghazal (South Sudan) until a referendum was held in 2011. However, the Administration has not yet been fully implemented, nor did the referendum occur as planned. When violence increased along the disputed borders, the United Nations mission, UNISFA, was established for demilitarizing and monitoring [4-8].

The UNISFA health care system is designed to provide medical service at different level of care. A total of ten level-I hospital with front medical team and aviation medical evacuation team owned by contingent are available at different site in the mission area and one UNOE level-1 hospital designed to give medical service for UN staff members and UNIFA level -IIhospital serves referral hospital from all level-I hospital and local community.

Study design

Retrospective document review study design was applied to analyze causes of medical repatriations and mortality among Ethiopian peacekeepers in the United Nations Interim Security Force for ABYEI (UNISFA) Mission from June 2011 to August 2020.

Variables

Dependent variables

Medical repatriations.

Independent variables

Age, sex, rank, mission location, educational status, service years, unit, organization, total stay in mission, numbers of death, numbers of medical repatriation, types of diseases.

Operational definition

An accident: Is defined as an unexpected happening causing loss or injury which is not due to any fault or misconduct on the part of the person injured. The most prevalent form of accident in UN operation is due to traffic.

Illness: Refers to fatalities due to disease, for example Malaria, Cholera or Ebola and illness from food or animal bites. These are fatalities that are not connected directly to hostile environments.

A malicious act: Against a UN peacekeeping mission occurs as a result of "war; invasion; hostilities; acts of foreign enemies, whether war be declared or not; civil war; revolution; rebellion; insurrection; military or usurped power; riots or civil commotion; sabotage; explosion of war weapons; or terrorist activities. As such, the death of a peacekeeper by malicious act can be broadly distinguished as a non-accidental or non-natural illness related death, caused through a deliberate act, by a malevolent actor.

"*Other*" which includes incidents such as suicide.

Medical repatriation

Contingent members/military personnel may be repatriated to their home country if they are assessed to be unfit for duty for the next 30 days, or if they require treatment that is not available in the mission.

Pre-deployment medical preparations

A standard list of pre-deployment medical preparations conducted for their peacekeeping personnel prior to their deployment should be made available to DPKO by the TCCs. This shall include any clinical examinations, x-rays and laboratory tests, as well as all vaccinations administered. Medical screening results of individuals are not required, unless specifically requested by DPKO.

Data Collection Instruments and Methods

All patients 'documents were used by check list which were referred to level three hospital (Addis Ababa) from June 2011 to Aug 2020 years. Variables were collected: age, sex, rank, education, marital status, types of diseases, numbers of repatriation, numbers of death, length of stay in mission, All medically repatriated individuals who were referred from Abyei level –II hospital to AFRTH Addis Ababa collected from both inpatient and outpatient registration books documented from June 2011 to- August-2020 years.

Data Analysis

The data was entered and analyzed using SPSS version 23 statistical package. Data cleaning was performed to check for accuracy, consistency and missed values. Frequencies, proportions and summary statistics were used to describe the study population in relation to relevant variables. The impact of selected socio- demographic and other characteristics that caused medical repatriations and types of disease and injury that caused mortality were investigated using both the bivariate method and the multivariate logistic regression technique.

Dissemination of the Result

After the research paper was completed & approved by the responsible bodies, the results of study was disseminated and communicated with the Defense Health Science College, Defense Health Main Department for planning and different offices where will be study carried out. Attempt will be made to publish the finding in reputable journals.

Results

This study assessed causes of medical repatriations and mortality among Ethiopian peacekeepers in the United Nations Interim Security Force for ABYEI (UNISFA) Mission. The study include 234 medically repatriated patients from June, 2011 to August, 2020 with complete clinical record. Data was analyzed by clinical category using ICD-10 diseases classifications and UN DPKO Data base.

Socio-demographic characteristic

Majority, 207(88.5%) of the study participants were male patients. The mean age of the patients was 40.63 years with standard deviation of +/- 9.13 years (range 22-60 years). More than half 118(50.4%) of patients age were 40 years and above. Two-thirds of patients 175 (74.8%) were married. More than half UN military rank 138 (59%) were NCO.

Majority 224 (95.7%) medically repatriated were contingents and 190(81.2%) stayed in the mission for less than 12 months. Most were active army, followed by civilian and retired army, 190(81.2%), 28(12.0%) and 16(6.8%) respectively. More than two-thirds 157(67.1%) of patients who repatriated to home country had history of past medical health problems **(Table 1)**.

Causes of medical repatriation from 2011 to 2020 years

A total of 234 cases repatriated from UNISFA Level –II hospital to Ethiopian AFCSH from June, 2011 to August, 2020, 170 (72.6%) were due to Illness, 50(21.4%) accidents, 10(4.3%) malicious act and 4(1.7%) others. **(Figure 1).**

Tables 1. *Socio-demographic characteristics of medically repatriated patients from UNISFA level-II hospital to AFCSH from June, 2011 to August 2020 (n=234).*

NO	Variables	Frequency	Percentage
1	**Age**		
	<40years	116	49.6
	>=40 years	118	50.4
2	Sex		
	Male	207	88.5
	Female	27	11.5
3	**Marital Status**		
	Married	175	74.8
	Single	53	22.6
	Divorced	6	2.6
4	Rank		
	Non- officer	138	59
	Officer	70	29.9
	Civil	26	11.1
5	**Educational Status**		
	8-10 grade	60	25.6
	11-12 Grade	88	37.6
	Diploma	39	16.7
	Degree and above	47	20.1
6	**Recruited condition**		
	Active Army	190	81.2
	Retired army	16	6.8
	Civilian	28	12
7	**Length of service**		
	< =20 years	151	64.5
	>20years	83	35.5
8	**Service components in UN**		
	Contingents	224	95.7
	SO/MO	10	4.3
	Total		
9	**Total Months Stay in Abyei Mission**		
	<= 12 months	190	81.2
	>12months	44	18.8
10	**History of past medical illness**		
	NO	77	32.9
	YES	157	76.1

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Disease's categories that cause repatriation in UNISFA Mission to Level-III hospital from, June 2011 to August, 2020

The three common causes of medical repatriations were 63(26.9%) Injuries, 39(16.7%) Diseases of digestive system and 30(12.8%) Mental and behavioral disorder. From Diseases of Gastrointestinal system, the most common cause was Intestinal obstruction 12(30.8%), followed by Peptic ulcer disease 11 (28.2%) and 5(12.5%) chronic liver diseases. From Mental and behavioral disorder 11(36.7%) where Major depressive disorder was the main cause followed by 7(23.3%) Acute Psychosis and 6(20%) schizophrenia. **(Table 2).**

Causes of medical repatriation in UNISFA Abyei Ethiopian peacekeeper from 01-Janaury 2019 to 31-December 2019

The three categorical classification of cause of repatriations from UNISFA Abyei Mission to Ethiopia, Addis Ababa level – III AFTRH were 33(71.7%) due to illness followed by 6(13%) helicopter crash, 5(10.9%) falling from car during patrolling and 2(4.3%) due to gun shot. The most frequent causes of repatriations from illness were cancer/tumor 18%, large bowel obstruction 12.1% and mental illness 12%. **(Figure 2)**

Trends in relative number of medical repatriations from 2011 to 2020 years

The Ethiopian army under the umbrella of UNISFA was deployed in Abyei administrator area in June 2011. From June, 2011 to August, 2020 years a total of 234 patients were repatriated from UNISFA Level –II hospital to Ethiopian AFCSH. In 2012 and 2013 years medical repatriation increased by 1.84 per 1000 compared 2011 cases and slightly decreased by 0.56 per 1000 in 2014, again up ward increment by 0.2 per 1000 in 2015 and 2016 years. Remarkable Peak upward trend seen in 2019 year by 8.02 per 1000 uniformed personnel compared to the year 2018 cases. Until August 2020, the repatriation declined by 6.55 per 1000 even though the year was not through while these researches was done. **(Figure 3).**

Causes of death in UNISFA mission from June, 2011 to August 2020

In UNISFA mission death issued by death certificate by senior medical officer and autopsy examination. The three common causes of death in UNISFA Mission were 38.2% due to illness, 29.4% Accident, 23.5% malicious act and 3(8.8%) others. From Illness cardiac arrest were 7(53.8%) the most common cause of death followed by acute respiratory failure 3(23.1%) and septic shock 2(15.4%). From accidents, land miming explosive were 5(50%) followed by Helicopter crash 3(30%) and car accident 2(20%) **(Table 3 and Table 4).**

Factors associated with medical repatriations

To determine the association between independent variables and medical repatriations among the study participants logistic regression analysis was carried out. Dependent variables classified in to two groups one group Injuries (accidents and malicious ac) and the second group illness. From the

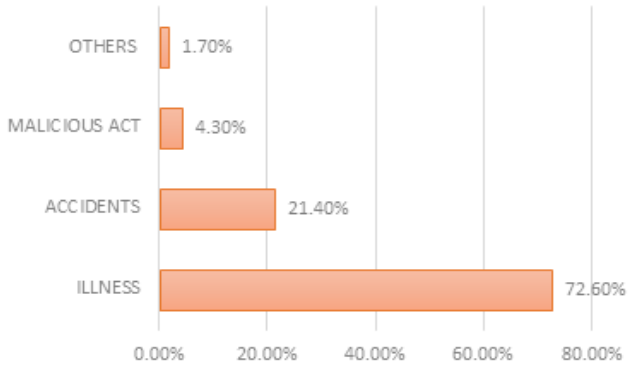

***Figure 1**. The percentage of patients who repatriated from UNISFA-II hospital to AFRTH from June, 2011to August 2020.*

***Table 2.** Causes of repatriation from UNISFA level-II hospital to Ethiopia AFRTH from 2011 to 2020 years (n=234).*

Causes	Frequency	Percentage
Injuries (Accidents and Bullet injuries)	63	26.9
Diseases of digestive system	39	16.7
Mental and Behavioral	30	12.8
Diseases of circulatory system	27	11.5
Diseases of Respiratory system	14	6
Neoplasms	12	5.2
Diseases of Genito-Urinary system	12	5.2
Diseases of Neurological system	10	4.4
Infectious diseases	11	4.7
Diseases of Eye and adnexa	9	3.6
Endocrine disorder (DM)	4	1.7
Others	3	1.3
Total	234	100

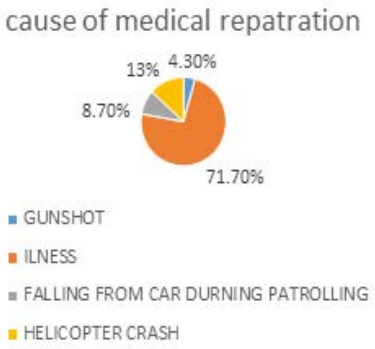

***Figure 2**. The percentage of patients who repatriated from UNISFA-II hospital to AFRTH in 2019 year.*

***Table 3.** Causes of death in UNISFA level-II from 2011 to 2020 years (n=34).*

Causes	No	Percentage
Illness	13	38.2
Cardiac arrest	7	53.8
Acute respiratory failure	3	23.1
Septic shock	2	15.4
Stroke	1	7.7.
Accidents	10	29.4
Land mining explosive	5	50
Helicopter crash	3	30
Car accident	2	20
Malicious act(Bullet)	8	23.5
Others (Suicidal)	3	8.8

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Table. 4 *Factors associated with medical repatriation UNISFA level-II hospital to Ethiopia AFRTH from 2011 to 2020 (n=234).*

No	Variables	Medical repatriation		COR (95%)	AOR (95%)	P
		Injuries	Illness			
1	**Age**					
	<40 years	40 (17.1%)	76 (32.5%)	1	-	
	>=40 years	24 (10.3%)	94 (40.2%)	2 (1.14-3.71)	-	
2	**Sex**					
	Female	1 (0.04%)	144 (61.5%)	1	1	0.09
	Male	63 (26.9)	26 (11.1)	11	16.6(2.03-135.74)	
	Rank					
	Non-officers	53 (22.6%)	111 (47.6%)	1	1	0.027
3	Officers	11 (4.7%)	59 (25.2%)	2.5	2.5(1.11-5.85)	
	Marital status					
4	Married	50 (21.4%)	125 (53.4%)	-	-	
	Single	14 (6.0%)	45 (19 2%)	-	-	
5	No	**Past medical conditions**				**0**
		45 (19.2%)	32 (13.7%)			
6	Yes	19 (8.1%)	138 (59.0%)	10	11.14(5.55-22.38)	
	Total length of Stay in Training center					
	< 6 months	37(15.8%)	65 (43.6%)	1	-	
	>=6 months	27 (11.5%)	105 (44.9%)	2.2	-	

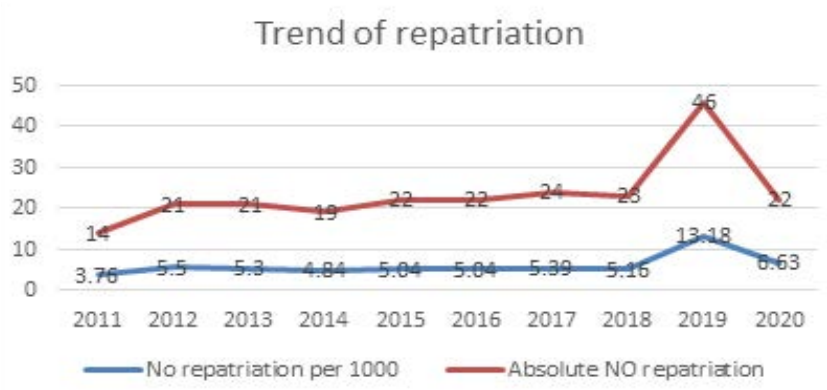

Figure 3. *Repatriation trend per 1000 uniformed personnel in UNISFA peace operations, 2011–2020(n=234).*

independent variables, marital status, length of mission stay and education of the patients were not associated with medical repatriations. In bivariate analysis age, sex, past medical history and rank were statistically significantly associated with medical repatriation with illness. However, the multi variables analysis indicated that only sex, rank and past medical history were statistically significantly associated with the medical repatriation due to illness, those who were male patients were 16 times repatriated by illness than females. (AOR=16.64; 95%CI=2.03-135.74, p=0.09), Higher rank officers 2.5 times repatriated by illness than Non-officers (AOR=2.5; 95%CI =1.25-6.14, P=0.027) and patients who had past medical history 11 times repatriated by illness than those who do not have a past medical problems (AOR=11.14; 95% CI =5.55-22.38, P=0.00).

Discussion

Causes and trends of medical repatriation

From June, 2011 to August, 2020 a total of 234 Ethiopian peacekeepers had been repatriated from UNISFA level –II hospital to Ethiopian AFCSH Due to Illness 72.6%, Accidents 21.4%, Malicious act 4.3% and others causes 1.7% and a total of 46 persnnel were repatriated to Ethiopia during the 12 months stay in 2019 year due toillness 71.7%, followed by helicopter crash 13%, falling from car during patrolling 10.9% and Gunshot 4.3%. On other hand a surveillance on UN persnnel in Nanmbia durning their 12 months stay showed a total of 46 patients had to be repatriated to their country of origin caused by illness 27 (59%) and injuries (mostly traffic accidents)19 (41%) [9].

The majority of patients were repatriated from the mission area to their home country due to chronic illness. From the diseases category of gastrointestinal system, complicated large bowel obstruction, Peptic ulcer disease, and chronic liver disease were the most common cause of the diseases that cause repatrations, the most frequent causes of repatriations in 2019 year from category of illness were cancer/tumor 18%, large bowel obstruction 12.1% and mental illness 12%. Our study contradicts with study done in Bosnia British army in which unlike our study non -commendable disease was not the causes of repatriation [10]. This indicates cancer and psychiatrics cases patients had preexisting medical problems

before deployment to the mission. Pre-deployment medical screening system was not compressive not including detailed examination using different diagnostic techniques. In the case of psychiatric problems doctors do not seem to give attention for mental status examination and psychiatric history taking.

Psychiatric problems were responsible for nearly one thirds of all repatriations from diseases categories to their home country. This is expected because among people working in developing countries psychiatric causes are a frequent reason for premature return home [11]. The most common causes of mental and behavioral disorder, which caused repatriation were major depression disorder 11 (36.7%) followed by Brief Psychotic disorder 7 (23.3%) and schizophrenia 6 (20%). This study is similar with the study done on Indian peacekeeper under UN mission where a total 23 psychiatric patients were repatriated during the study period (2011-2015) on various UN missions; the most common mental disorders that caused of repatriations were major depression disorder. But contradicting to our study a research done in Bosnia-Herzegovina, British personnel 21 (5%) of Psychiatrics cases repatriated. High number of psychiatric casualties can be expected from an epidemiological surveillance, a military psychiatrist was deployed to Bosnia during the third month of Operation Resolute. This greatly reduced the incidence of repatriations on psychiatric grounds [9].

In 2019 year falling accident from car durning patroling comprised 10.9 % of repatriations which was due to speeding, luck of approrate safety durning comboy for escorts, ignorance of safety measure and the damaged rode of abyei.

Trend analysis of medical repatriations indicates slightly increased from year to year but remarkable increscent seen in 2019 year. In 2012 and 2013 years medical repatriations increased by 1.84 per 1000 uniformed personnel 2011 year cases and slightly decreased by 0.56 per 1000 in 2014, again up ward increment by 0.2 per 1000 in 2015 and 2016 years. Peak upward trend seen in 2019 year by 8.02 per 1000 uniformed personnel compared to the year 2018 cases. Until August 2020 year, the repatriation declined by 6.55 per 1000 even though the year was not through while these researches was done. This highest repatriation in year of 2019 could be helicopter crash, strict follow of repatriations criteria, and delay of rotation more than one years and poor medical screening system before the deployed to the mission area.

Majority of patients who were repatriated from the mission stayed less than 12 months. This indicates premature return to home country which resulted wastage of manpower's'. Multi variables analysis indicated that sex, rank and past medical history were statistically significantly associated with the medical repatriation by illness, those who were male patients were 14 times repatriated by illness than females. (AOR=14.4; 95%CI=1.70-118.72, p=0.013), Higher rank officers nearly 3 times repatriated by illness than Non-officers (AOR=2.6; 95%CI =1.25-6.14, P=0.026) and patients who had past medical history nearly 10 times repatriated by illness than those who do not have a past medical problems (AOR=9.8; 95% CI =4.83-19.97, p=0.00).

Causes of death in UNISFA ABEYI mission from June, 2011 to August 2020 years

The three common causes of death in the UNISFA Mission were 38.2% *by* illness, 29.4% by accident, 23.5% by malicious act and 3*(*8.8%) by others. The most common cause of *death* from illness were cardiac arrest 7 *(*53.8%)*, followed* by Acute respiratory failure 3 *(*23.1%) and septic shock 2 *(*15.4%). From accident land miming explosive were the most common cause 4 *(*40%) followed by Helicopter crash 3 *(*30%) and 2 *(*20%) car accident. But the result of our study was found to be different from the study done at the Johns Hopkins School of Public Health showing Overall accidents were the most common cause of death accounting for 41.2 percent, followed by 36.1 percent of deaths from hostile acts and 22.7 percent from illness and other causes. However, over the last decade, the relative risk of dying from hostile acts increased 1.51 times accounting for 24.1 percent of all deaths during the Cold War and 37.6 percent of all deaths in the post-Cold War period. There were no differences in death rates from illness and other causes. The largest portion of deaths occurred in the Middle East and Africa but it is important to note that there have been more UN peacekeeping missions in Africa than in any other region [12,13]. The death analysis in Ethiopian peacekeepers indicated more death occurs by illness than accidents and malicious acts, this indicate poor pre-deployment screening system and military personnel who came with pre-existing medical condition which were aggravated by stressful mission and weather condition. In general, UNISFA mission is not a high-risk comparing with other UN mission.

Suicide in Ethiopian peacekeepers were found to be rare only comprising 3(8.8%) deaths recorded in 10 years in the UN mission as compared to 66 suicides in the Canadian military between 1990-1995. This could be related to the psychosocial like intergroup bonding livelihood background and mutual support between the Ethiopian military personnel may be the reason.

Limitation of the Study

The study considered secondary data kept as In-and-out patients' documents record at the hospitals. In addition, we have attempted to collect patient's data over the last ten years in the face of poor documentation practices. Thus, the quality of information obtained from these finding is to some extent affected by incompleteness and Unavailability of patients' data especially past medical history of repatriated individual.

Conclusion

This study concludes that, Analysis of causes of repatriations and death in Ethiopian peacekeepers indicated more repatriations and death occurs by illness than accidents and malicious acts. The majority of patients who were repatriated from the mission area to their home country due to chronic illness and two-thirds of patients had past medical history. This indicated poor pre-deployment screening system and pre-existing medical condition which was aggravated by stressful mission and weather condition.

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Ethical consideration

Ethical clearance for the research was obtained from the ethical review committee of College of Health Sciences University of Defense. Communication with the different office was made through formal letter obtained from Defense University college health science. This study caused no physical or psychological harm to the patients and they will not be exploited in any way. Information pertaining persons were kept confidential. Individual identifiers like names and other personal information were excluded from the questionnaire.

Declarations

Ethical approval

Ethical clearance for the research was obtained from the ethical review committee of College of Health Sciences University of Defense.

Competing interest

The authors declare that they have no significant competing financial, professional, or personal interest that might have.

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