

## Common Injuries among Military Recruits in Selected Training Centers of Bangladesh Army

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DOI: <https://doi.org/10.3329/jafmc.v17i2.58358>

### Abstract

**Introduction:** Bangladesh army has a continuous process of recruit training throughout the year in its different training centers. While training, recruits suffer from a lot of health problems which hinders their physical training as well as academic activities. In this regard "Injury" is the main problem as identified. In Bangladesh, there is little data obtained as regard to the common injuries among recruits.

**Objectives:** To ascertain common injuries of recruits in selected military training centers of Bangladesh Army.

**Materials and Methods:** This cross-sectional, descriptive study was conducted from 01 July 2018 to 30 June 2019 at Chattogram Cantonment, Chattogram in two selected training centers of Bangladesh Army for the initial 06 months of the training period. The samples were selected purposively. Among 2702 study population the number of injured recruits (Respondents) was 152. A semi-structured pre-tested questionnaire and checklist were used as the research instrument.

**Results:** Among the 152 respondents 65(42.8%) suffered from sprain, 43(28.3%) from shin pain, 20(13.2%) from fracture, 9(5.9%) from muscle strain, 6(3.9%) from low back-pain, and 9(6%) suffered from other different types of injuries.

**Conclusion:** Further study is needed to conduct through out the full duration of the recruit training to ascertain more specifically the common injuries among the recruits in BD Army.

**Key-words:** Common injuries, Military recruits, Training centers, Bangladesh Army.

### Introduction

In armed forces people, musculoskeletal injuries due to training activities is a big problem which hampers the training period and physical fitness of the troops. The injury rate among armed forces personnel varies due to differences in selection criteria, physical fitness of recruits and training modules<sup>1</sup>. To identify the factors related to injuries, types of injuries among the military population and to minimize the sufferings from injuries many studies were conducted in different armed forces throughout the world<sup>2</sup>.

Due to training injuries recruits suffer from training period loss, reduction in physical fitness and at times may even be discharged from the forces. This causes financial loss not only for the recruits,

but also for the institution. The injury related factors differ between countries due to differences in recruit characteristics, training regimens, and environmental factors<sup>3</sup>. In a study by Cowan DN et al<sup>4</sup> among 303 men over 12 week of army infantry basic training revealed the five most common injuries were 23.8% for pain due to "overuse" or "stress syndrome," 8.6% muscle strains, 6.3% ankle sprains, 5.9% overuse knee injuries, such as patella-femoral syndrome and 3.0% stress fractures.

One descriptive cross-sectional study was conducted by Mohsin M<sup>5</sup> among the recruits of Bangladesh Army in 2007 in two selected training centers where he found the most predominant injury was shin splint 36.7%, followed by sprain ankle 19.3%, stress fracture 12.8%, knee injury 12.8%, muscle strain 12.8%, contusion leg or foot 11%, plantar fasciitis 2.7%, the lowest was fracture due to forceful event 1.8% and total 5.5% had other injuries. To ascertain common injuries of recruits in selected military training centers of Bangladesh Army this study was conducted.

### Materials and Methods

This descriptive cross-sectional study was conducted from 01 July 2018 to 30 June 2019 at Chattogram Cantonment, Chattogram where 02 of the largest training centers of Bangladesh Army are situated; one is East Bengal Regiment Center (EBRC) and another is Artillery Center & School (AS&C). Data were collected from the center's Medical Inspection Rooms (MI room) and Combined Military Hospital (CMH) Chattogram purposively. The study populations were 1500 and 1202 in EBRC and AC&S respectively. In this study purposive type of non-probability sampling technique was used. Time frame sample size is taken. Recruits who developed any injury from January to June 2019 were taken as sample. A semi-structured pre-tested questionnaire and checklist were used as the research instrument. Ethical issue was addressed. Data were checked and verified thoroughly to reduce inconsistency. Collected data was analyzed using Statistical Package for Social Science (SPSS version 20). Analysis was done on the injury data to determine any significant association found in respect to few other variables between the two centers. Significance was set at 0.05 level. Descriptive statistics were calculated.

### Results

A total of 1500 and 1202 recruits joined in East Bengal Regiment Center (EBRC) and Artillery Center & School (AC&S) for recruit

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entry training from January 2019 respectively for a total period of 01 year. From the total 2702 recruits 152 reported sick to the dependent health care facilities for having different types of injuries. Among the total 152 respondents, 81(53.3%) were from EBRC and 71(46.7%) were from AC&S. The overall frequency of injury in two centers was 5.63% whereas the injury frequency in EBRC was 5.4% and in AC&S was 5.9% respectively. The mean age of the total 152 respondents was 18.7 years with SD of ± 0.9 years. The minimum BMI was 17.1 kg/m<sup>2</sup> and maximum 31.5 kg/m<sup>2</sup>. Only 9(5.9%) found underweight and 6(3.9%) found overweight.

Among 152 respondents, highest 65(42.8%) suffered from sprain, and 43(28.3%) from shin pain, 20(13.2%) from fracture, 9(5.9%) from muscle strain, 6(3.9%) from low back-pain, only 1(0.7%) from dislocation, and 8(5.2%) suffered from other different type of injuries (Table 1). Of the total 152 respondents from both the centers, 81(53.3%) were from EBRC. Of them 33(21.8%) developed shin pain, 21(13.8%) had sprain in joints, 18(11.8%) had fracture, 04 (2.6%) had muscle strain and 05 (3.3%) had other type of injuries. Seventy one (46.7%) of the respondents was from AC&S. Of them 44(28.9%) developed sprain in different joints, 10(6.6%) had shin pain, 05(3.3%) had muscle strain, 06 (3.9%) had low back-pain, 02(1.3%) had fracture and 03(2.0%) had other type of injuries. Significant association found between the two centers in respect to type of injury. ( $p < 0.01$ ) (Table-I).

Out of 152 respondents, only 20(13.1%) had fracture. Among them, 16(80.0%) had stress fracture, followed by 4(20.0%) incomplete fracture. The most common bone fractured was tibia 17(85.0%), followed by fibula, radius, and femur, each of 1(5.0%) case (Table-II). Out of 152 respondents, most of them 134 (88.2%) got injury to the lower extremity, 10(6.6%) cases to the upper extremity, 5(3.3%)cases to the vertebral column, and 03(2.0%)to the head-neck area (Figure-1).

**Table-I:** Distribution of the respondents by training center and type of injury).

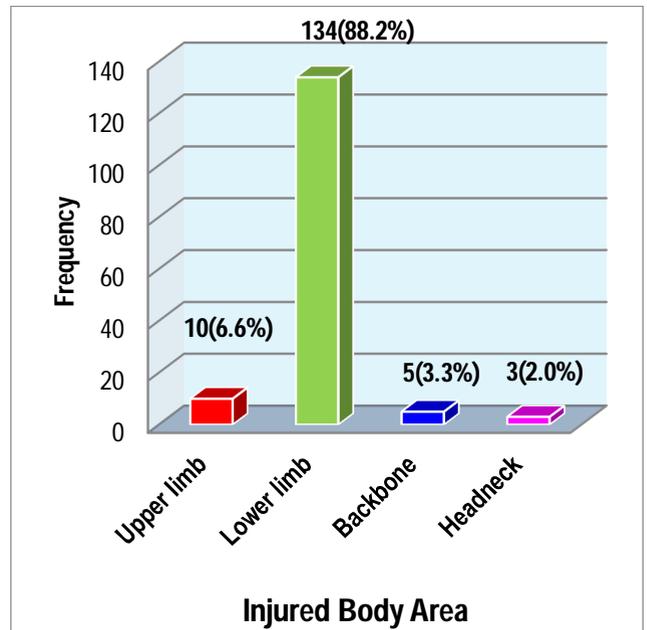
Type of injury	Name of the center		Total	Statistics
	EBRC	AC&S		
Sprain	21(13.8)	44(28.9)	65(42.8)	$\chi^2 = 41.669$ $df = 7$ $p < .001$
Dislocation	0	01(0.7)	01(0.7)	
Fracture	18(11.8)	02(1.3)	20(13.2)	
Shin pain	33(21.8)	10(6.6)	43(28.3)	
Muscle strain	04(2.6)	05(3.3)	09(5.9)	
Low back-pain	0	06(3.9)	06(3.9)	
Others	05(3.3)	03(2.0)	08(5.3)	
<b>Total</b>	<b>81(53.3)</b>	<b>71(46.7)</b>	<b>152(100)</b>	

\* Percentage in Parenthesis. Fisher's Exact was done. EBRC =East Bengal Regiment Center, AC&S=Artillery Center and School

**Table-II:** Distribution of the respondents by type of fracture and bones involved.

Bones involved	Type of fracture		Total
	Stress fracture	Incomplete fracture	
Tibia	15(75)	02(10)	17(85)
Fibula	0	1(5.0)	1(5)
Radius	0	1(5)	1(5)
Femur	1(5)	0	1(5)
<b>Total</b>	<b>16(80)</b>	<b>4(20)</b>	<b>20(100)</b>

\* Percentage in Parenthesis.



**Figure-1:** Distribution of the respondents by body part affected by injury.

**Discussion**

All over the world, training-related injuries are major problem among the armed forces personnel. To ascertain the common injuries among the recruits of Bangladesh Army this study was carried out. In the present study the overall frequency of injury in two training centers was 5.6%. Sulsky SI et al<sup>6</sup> in their study stated that training injuries varies from 6% to 12% among the recruits. Kaufman KR et al<sup>1</sup> found training injuries variation from 8% to 51% among male recruits. Variation in injury incidence rates among army recruits in different countries was due to differences in training practices, training populations, environmental conditions and injury prevention strategies.

Among 152 respondents highest 42.8% suffered from sprain, 28.3% from shin pain, 13.2% from fracture, 5.9% from muscle strain, 3.9% from low back-pain, only 0.7% from dislocation, and 5.2% suffered from other different type of injuries. Of the total 152 respondents from both the centers, 81(53.3%) were from EBRC. Of them 40.7% developed shin pain, 25.9% had sprain in joints,

22.2% had fracture, 4.9% had muscle strain and 6.2% had other type of injuries. Seventy one (46.7%) of the respondents was from AC&S. Of them 62% developed sprain in different joints, 14.1% had shin pain, 7.0% had muscle strain, 8.5% had low back-pain, 2.8% had fracture and 4.2% had other types of injuries. Highly significant association found between the two centers in respect to type of injury ( $p < 0.001$ ).

In US army a study by Cowan DN et al<sup>4</sup> revealed that the most common five injuries among the recruits during basic training were overuse or stress syndrome 23.8%, muscle strains 8.6%, ankle sprains 6.3%, overuse knee injuries 5.9%, and stress fractures 3.0%. In another study by Jones BH et al<sup>7</sup> revealed that the commonest injuries among United States male recruits was low-back pain 7.3%, tendinitis 6.5%, sprains 4.8%, muscle strains 3.2%, and stress fractures 2.4%. Study by Kaufman KR et al<sup>1</sup> revealed ankle sprains 6.2%, Ilio-tibial Band Syndrome (ITBS) 5.3%, stress fractures 4.0%, patellar tendinitis 2.4%, and shin splints 1.8% as the most common injuries among the recruits. Study among British trainees by Sharma J et al<sup>8</sup> found the five most common diagnosis were ITBS 6.2%, Medial Tibial Stress Syndrome 5.7%, ankle sprains 5.0%, low back-pain 4.6% and combined injury of upper body, head and neck 4.0%. Study in Pakistan by Alam M<sup>9</sup>, out of 305 recruits, 67.9% had surgical admissions. There were training related injuries as fractures, dislocations, trauma etc. A study in China by Hu G et al<sup>10</sup> shown that 65.4% injuries were due to sprain, strain, and rub injuries and these are the commonest. Among the injuries 77.7% belongs to overuse injuries of the skeletal and muscular systems, the most common type of which was stress fractures as revealed by Wang X et al<sup>11</sup>. The only descriptive cross-sectional study so far found conducted by Mohsin M<sup>5</sup> among the recruits of Bangladesh Army in 2007 in two selected training centers where he found the most predominant injury was shin splint 36.7%, followed by sprain ankle 19.3%, stress fracture 12.8%, knee injury 12.8%, muscle strain 12.8%, contusion leg or foot 11%, plantar fasciitis 2.7%, the lowest was fracture due to forceful event 1.8% and total 5.5% had other misc. injuries. These results showed some variation. The reason of such variation might be well depicted from obvious difference of pattern in diagnosis of injuries, socio-demographic setting and also that of training environment between these study places.

In this study out of 152 respondents, only 13.1% developed fracture. Among them, highest 80% had stress fracture, followed by 20% of incomplete fracture. The most common bone fractured was tibia 85%, followed by fibula, radius, and femur, each with 5% case. The result varied with the results of two Indian studies. In India, Bhalwar R<sup>12</sup> found the rate of stress fracture as 12.7 per 1000 recruits. Again Sing SC et al<sup>13</sup> has revealed stress fracture incidence in Indian Military Academy as 36.5 per 1000 cadets. The variations observed in the results might be either due to difference in training environments of those study places or due to socio-demographic differences.

In the present study out of 152 respondents, 88.2% cases got injury to the lower limb, 6.6% cases to the upper limb, 3.3% cases to the vertebral column, and 2.0% to the head-neck area. Maximum injuries were in lower limb in both the centers as found in other studies among army recruits also. Study by Kaufman KR<sup>1</sup> revealed that the majority of injuries were lower extremity Musculo-skeletal Injury (MSKI). In the study by Robinson M et al<sup>14</sup> knee 27%, foot 26%, ankle 18% and shin 10% were the most frequently reported injury sites. Bhalwar R<sup>12</sup> in his study among Indian recruits also found fracture and joint injuries of lower limbs as the majority of training injuries. Study in Pakistan by Alam M<sup>9</sup> revealed that from a total of 20.9% cases of fractures, the majority were of lower limbs.

## Conclusion

In this descriptive cross sectional study, the overall frequency of injury in two recruit centers (EBRC & AC&S) was 5.6% which reflects that the physical training component in Bangladesh Army is appropriate. In Bangladesh Army the increased of duration of recruit training from 06 months to 12 months helped to reduce the injury a lot. Among the 152 respondents, common injuries were found as sprain, shin pain and fracture. Further study is needed to ascertain the causes related to the injuries to take preventive measures to minimize the injury morbidity among the Bangladesh Armed Forces recruits.

## References

1. Kaufman KR, Brodine S, Shaffer R. Military training-related injuries: Surveillance, research, and prevention. *American journal of preventive medicine*. 2000; 18(3):54-63.
2. Knapik JJ, Sharp MA, Canham-Chervak MI et al. Risk factors for training-related injuries among men and women in basic combat training. *Medicine and science in sports and exercise*. 2001; 33(6):946-54.
3. Blacker SD, Wilkinson DM, Bilzon JL et al. Risk factors for training injuries among British Army recruits. *Military medicine*. 2008; 173(3):278-86.
4. Cowan DN, Jones BH, Tomlinson JP et al. Epidemiology of injuries associated with physical training among young men in the army. *Army Research Institute of Environmental Medicine*; 1993. *Med Sci Sports Exercise*. 1993; 25(2):197-203.
5. Mohsin M. Injury pattern among Bangladesh Army Recruits. *JAFMC* 2018; 14(2):123-6.
6. Sulsky SI, Bulzacchelli MT, Zhu L et al. Risk factors for training-related injuries during US army basic combat training. *Military medicine*. 2018; 183(suppl\_1):55-65.
7. Jones BH, Bovee MW, Harris III JM et al. Intrinsic risk factors for exercise-related injuries among male and female army trainees. *The American journal of sports medicine*. 1993; 21(5):705-10.

8. Sharma J, Greeves JP, Byers M et al. Musculoskeletal injuries in British Army recruits: A prospective study of diagnosis-specific incidence and rehabilitation times. *BMC musculoskeletal disorders*. 2015; 16(1):106.
9. Alam M. Morbidity Profile of Recruits during basic Military Training. *Pakistan Armed Forces Medical Journal*. 2013; 1(3):109-113.
10. Hu G, Tan A, Liu X et al. Injury incidence among recruits in basic military training and related factors in China. *Injury prevention*. 2012; 18 (Suppl 1):A158-9.
11. Wang X, Wang PS, Zhou W. Risk factors of military training-related injuries in recruits of Chinese People's Armed Police Forces. *Chinese journal of traumatology. Zhonghuachu-angshangzazhi*. 2003; 6(1):12-7.
12. Bhalwar R. Prospective study on the morbidity profile of recruits over one year in three large Regimental Training Centres. *Medical Journal Armed Forces India*. 2004; 60(2):113-6.
13. Singh SC, Banerjee A. Stress fractures: effect of prior physical activity, sports participation and military training. *Medical Journal Armed Forces India*. 2000; 56(1):24-6.
14. Robinson M, Siddall A, Bilzon J et al. Low fitness, low body mass and prior injury predicts injury risk during military recruit training: A prospective cohort study in the British Army. *BMJ open sport & exercise medicine*. 2016; 2(1):e000100.