

# Injuries of the floating crew of the Northern water pool in a state of alcoholic intoxication

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## ABSTRACT

The analysis of injuries of floating crew of the Northern water pool in a state of alcoholic intoxication have been based on the 180 accidents on board of ships with temporary loss of ability to work, and 1686 case histories with alcoholic injuries, which demanded treatment in a surgical department. Among persons, the received injuries on the ship in the state of alcoholic intoxication were 8.1% of the victims: in the strength of the transport fleet – 8.9%; fishing – 8.9% and river ones – 4.1%. Masters of fish production, skippers, rulers of the radio stations and masters of fish processing were most frequently injured after the consumption of the alcoholic beverages. Alcoholic injuries have been recorded at the time of walking on the catwalk and the decks (54.2%), mooring operations (15.1%), maintenance and repairing the deck machinery, water preparation (6.6%), as well as boat and loading-unloading works (4.3%). Falls from height constituted 36.6% of the injuries. Alcohol in 3.2 times increases the weight of the combined injuries. The deaths from the alcohol related injuries in marine conditions (43.4%) significantly exceed the indicators in the group of non-alcoholic injuries (7.0%). Alcoholic intoxication has been noted in 35.0% of the cases of the floating crew injuries, hospitalised in the surgical department. Victims with alcoholic injuries received during performing ship's works were hospitalised 10 times less, than those with non-productive types of injuries. In the structure of non-industrial injuries, household injuries prevail (78.2%) over those received due to falls on the street, in pedestrian flows (10.3%), transport and traffic accidents (6.7%), intentional injuries (4.1%) or those connected with sports games and competitions (0.7%). Fishermen are a professional group of seamen, subject to the high social vulnerability to the alcoholic beverages consumption and related injuries.

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**Key words:** floating crew, transport fleet, fishing fleets, river fleet, Northern water pool, navigation conditions, injury, occupational accidents, types of vessel's works

## INTRODUCTION

Medical and hygienic studies on alcohol injuries are directed on revealing the industrial, occupational and social risk factors among different population groups. Alcohol is a cause of severe injuries in a 3.0–50.0% of cases in the different sectors of economy: transport, agriculture or forest industry. There is a clear relationship of the alcohol consumption and high frequency of alcoholism with such activities, in which the workers are exposed to occupational hazards as: hot, dusty air, the monotony of the actions on the

assembly line and unfavourable meteorological conditions while working outside. In accordance with the above, alcoholism is most widely distributed among smiths, casters, construction workers engaged in building the roads, sandblast machine operators, welders, dockworkers and sailors [1]. Many researches refer to the seafarers with malignant diseases in combination with severe mental pathology [2, 3]. Diagnosis of alcoholism among the floating crew is set 2.5 times more often than among men of the territorial population. The difference is seen especially in the



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20–29 years age group [4, 5]. As a direct cause of the floating crew hospitalisation, alcoholic intoxication has taken the third place and become the most important risk factor of the health violation of this contingent of industrial workers [6–8]. Alcohol very often leads to the hospitalisation at the departments of surgical profile [9, 10]. In less than 10 years treatment of alcoholism among seafarers appears more often than in control groups and often links to injuries, accidents and poisoning [11–14]. Mortality rate among seafarers due to the alcohol abuse is 5 times higher than in the territorial population [15]. In the analysis of merchant marine and fishing fleets fatal injuries to themselves it was shown that among the victims there were 94% of men and 6% of women, mostly aged from 25 to 35 years [16]. Most common reasons for the emergence of domestic injuries were hooliganism and fights, which were preceded by drinking and quarrels. In 70% of cases the victims and in 82% — the attackers were in a state of alcoholic intoxication at the moment of damage.

## MATERIALS AND METHODS

The analysis of injuries of floating crew of the Northern water pool in a state of alcoholic intoxication have been based on 180 accidents on board of ships with temporary loss of ability to work, and 1686 case histories with alcoholic injuries, which demanded treatment in the surgical department. Analysed: demographic indicators of floating crew of the Northern water pool; data of the accounting-reporting of the medical documentation: a) regular reports of the ship's medical staff; b) ship's medical journals (form No. 074); c) medical cards of the outpatient patients (form No. 025); d) extracts from patients' medical records (form No. 27); e) medical records of patients (form No. 003); f) reports on the causes of temporary disability (form 16 TD); g) acts of accidents (form N-1). The diagnosis of alcohol intoxication was established on the basis of conclusion of the ambulance doctor, ER doctors, the teams of surgeons and the concentration of alcohol in the blood. In all this cases diagnosis "alcoholism" was made as a secondary diagnosis. Production injuries on the vessels in alcoholic intoxication have been reflected in the certificate about the accident on manufacture on the form N-1. While working on the material such methodological approaches have been used: systematic, comprehensive, integrative, functional, dynamic, process, regulatory, quantitative, administrative and situational. Methods of analysis included: analysis and comparison. Techniques used: group, the absolute and relative values, averages, time series, continuous observation of detail and generalisation.

## RESULTS

Among floating crew of the Northern water pool, the received injuries on ships in a state of alcoholic intoxication

were 8.1% of the victims. Most of them have worked on the transport (65.8%), river (18.3%) and fishery (7.4%) fleets. The specific weight of injuries received by the sailors of the transport fleet in a state of alcoholic intoxication when performing a variety of jobs was in the general structure the 8.9% of the cases (from 18.0 per 1000 workers), fishing fleets — 8.9% (9.9) and river — 4.1% (2.8) [17–22]. Significant differences in the frequency of alcohol injuries of the floating crew of the Northern region on fleets depend on the specifics of the production activities, the area of navigation and regularity of visits to the port [23, 24]. Their high level of transport vessels associated with the daily hard work of seafarers and transportation of valuable household goods have been quickly replaced by climatic and geographical conditions of navigation, frequent calls at ports, maritime hospitality and traditions [25, 26]. The river workers, as well as sailors, during the transportation of cargo make calls at ports, and have significant opportunities to purchase and consume the alcoholic beverages on board of the ship. On the fishing vessels, on the contrary, it is in the areas of fishing for 3–4 months or more, the supply in the alcoholic beverages from outside the vessel does not occur. Therefore, isolated cases of injuries are recorded only when the vessels park in the ports.

The floating crew revealed a tendency towards increasing the frequency of injuries in a state of alcoholic intoxication in the older age groups. The masters of fish production (44.9 from 1000), the skippers (33.7 from 1000), the heads of radio stations (30.0 from 1000), the masters of fish processing (25.2%) were most frequently injured after the consumption of the alcoholic beverages. High risk groups are sailors and boatswains (14.0), minders and navigators (13.1), mechanics (11.6) and cooks (8.8). The maximum frequency of traumatism was registered among the persons with the work experience up to 1 year (29.1) [27–29]. Incidents are more low among crew with 3.5–10 years working experience when comparing with those who just came on the fleet of the beginners (9.9). Damage have occurred during transitions along the catwalk and the decks (54.2%), mooring operations (15.1%), service and repair of the deck machinery, water preparation (6.6%), as well as boat and loading-unloading works (4.3%), that is these marine works, which are most frequently met in the preparation of the vessels to the departure and approach to the mooring lines. A significant number of injuries (36.6%) were due to the falls from a height [30, 31].

Traumatic agents in the injuries in a state of alcoholic intoxication have been: blunt (81.1%) and acute (6.9%) objects as well as thermal ones (5.2%). In the structure of the weekly cycle, the alcoholic injuries occurred as follows: Monday–Wednesday — 59.2%, while Friday–Sunday only 24.8%. The seasonal distribution of the weight of alcohol

**Table 1.** Structure of poly injuries of the Northern water pool floating crew on board ships and according to the materials of the surgical department ( $P \pm m\%$ )

Polytrauma	On board ships		Materials of surgical department	
	The influence of alcohol	Without the influence of alcohol	The influence of alcohol	Without the influence of alcohol
Multiple injuries	54.6 ± 7.5	84.9 ± 1.6	57.6 ± 1.7	76.0 ± 1.4
Combined injuries	45.4 ± 7.5	14.4 ± 1.6	40.2 ± 1.7	23.4 ± 1.3
Combination of injuries	–	0.7 ± 0.3	2.2 ± 0.5	0.6 ± 0.2
Total	100.0	100.0	100.0	100.0

**Table 2.** The structure of the Northern water pool floating crew injuries by type of damage on board ships and according to the materials of the surgical department ( $P \pm m\%$ )

Type of injury	On board ships		Materials of surgical department	
	The influence of alcohol	Without the influence of alcohol	The influence of alcohol	Without the influence of alcohol
Bruises	10.4 ± 1.9	16.3 ± 0.6	10.7 ± 0.6	11.3 ± 0.4
Wounds	19.2 ± 2.4	15.5 ± 0.6	30.8 ± 0.9	15.9 ± 0.6
Head injuries	14.6 ± 2.1	3.6 ± 0.3	16.8 ± 1.7	12.3 ± 0.5
Fractures	14.6 ± 2.4	41.0 ± 0.8	33.2 ± 0.6	39.9 ± 0.7
Traumatic amputation	1.8 ± 1.7	6.5 ± 0.4	1.2 ± 0.2	2.4 ± 0.2
Burns	4.5 ± 2.2	5.7 ± 0.4	2.7 ± 0.3	4.9 ± 0.3
Frostbites	–	0.6 ± 0.4	3.0 ± 0.4	0.4 ± 0.1
Dislocations	1.8 ± 1.7	1.0 ± 0.2	0.8 ± 0.2	2.3 ± 0.2
Other types of damages	33.1 ± 2.8	9.8 ± 0.5	0.8 ± 0.2	10.6 ± 0.5
Total	100.0	100.0	100.0	100.0

injury crew varies from 28.1% in the summer to 22.1% in the winter ( $p > 0.05$ ). The basic quantity of alcoholic injuries of the crew occurs during the shipboard sites (of 84.4%), including every second in the native port (50.8%), and the other – in different ports. Alcoholic intoxication in 3.2 times increases the weight of the combined injuries (Table 1). In the first 12 hours after the injury in a state of alcoholic intoxication there were hospitalised in the surgical department 88.4% of the injured crew (while in the control group only of 74.6%). The structure of injuries of the crew associated with the use of alcohol is presented in the Table 2.

Traumatic brain injuries ( $p < 0.001$ ) and wounds ( $p > 0.05$ ) that occur during vessel's work are mainly associated with alcoholic intoxication of the victims. Among the brain injuries there were 51.0% of brain concussions, 16.0% of the bones of the base and vault of the skull fractures, 34.0% – bruises and wounds of the soft tissues [32]. In the alcohol-related injuries of the upper extremities fractures were more than 61.0% of all damage, lower 24.0–43.0%; open – 26.0%, in the control group – 16.8% [33]. The weight of the wounds is respectively 20.2% and 23.0–31.8%,

bruises 15.2%, and 31.6–52.4%. In the burn injury in a state of alcoholic intoxication floating crew have mainly received thermal destruction of the II degree from 3.2% to 10.0% of the surface of the skin with the localisation on hands, feet and front abdominal wall [34]. Surgical treatment has been carried out at 43.1% of the victims of the injuries; operations – 12.7%; in the rest of the cases conservative methods of treatment have been used [35, 36]. The deaths and injuries in a state of alcoholic intoxication (43.4%) significantly exceed the indicators in the group of non-alcoholic injuries (7.0%,  $p < 0.001$ ) [37, 38].

The accommodation of the floating crew in the surgical clinic for injuries in a state of alcohol intoxication noted at 35.0% of cases (60.5) of the crew of the Northern basin, including: 28.7% of the transport fleet (53.5), 39.3% – fishing (78.8) and 28.9% – river (46.6), suggests a pronounced dependence of accidents and consumption of ethanol at this contingent of transport workers [39, 40]. Alcoholic intoxication in combination with trauma occurs 6 times more often in males than in females ( $p < 0.001$ ). The analysis of the standardised indicators of hospitalisation of the crew

in the surgical department on injuries in a state of alcoholic intoxication among men showed approximately the same level among seafarers and boatmen, among fishermen this number is 1.4 times more. Women with alcoholic intoxication which required hospitalisation were from transport vessels [41, 42].

More than half of the injuries in a state of alcoholic intoxication (51.8%) have been received by the floating crew in the age group up to 30 years old. In the age groups from 20 till 30 years old, there has been the highest frequency of injuries due to the use of alcoholic beverages (88.6% and 88.2% respectively). In the older age groups up to 40 and older than 50 years there has been a consistent decline in the number of alcohol related injuries (49.4% and 45.2% respectively), but there has been a growth in the ages of 40–49 years – 84.6%, i.e. returning to the level of traumatism of the crew of younger ages [43–45]. This tendency finds its confirmation in the structural analysis of the weight of injuries of floating crew in the age groups. More than half of the injuries to persons of 40–49 years have been obtained in a state of alcoholic intoxication. Within each of the fleet the frequency of hospitalisation has been declining steadily with the age, reaching minimum values for the crew over 50 years of age. Reduction rate is the highest among boatmen, the lowest – in fishers [46–49].

In the structure of the affected floating crew the service operation of ships has received almost half of alcoholic injuries (49.6%), while the service of technical operation 6.0% less. In the third place there is a service of life (4.5%), followed by the services of radio (1.8%) and processing of products. Masters of fish processing, sailors, minders, masters, mechanics, navigators, cooks, and bakers most often in a state of alcoholic intoxication received serious injuries requiring treatment in the stationary conditions. Among the victims two-thirds of patients (67.6%) were sailors and minders. The mechanics have been hospitalised in every tenth case (10.8% of cases) [50–52]. The standardised indicators of hospitalisation of the crew for the injuries in a state of alcoholic intoxication among marine specialists of the main occupations were highest among the workers of the fishing fleet: sailors, minders, mechanics, cooks, navigators and captains. At the transport fleet – minders, captains, sailors, mechanics, navigators and cooks. Distribution of the rank of seats frequency of expected hospitalised with injuries in a state of alcoholic intoxication was as follows: mechanics, minders, captains, sailors and navigators. As a whole on the Northern water pool machine and deck all three fleets were hospitalised at the clinic for injuries in a state of alcoholic intoxication significantly more likely than the command. The high frequency of alcoholic intoxication can be noted among cooks, bakers, orderlies and cleaners [53]. Hospitalisation of floating crew with injuries in a state

of alcoholic intoxication received in the industrial conditions in the implementation of ship works (6.1) is produced in 10 times less, compared with non-production (60.7). The seafarers can provoke different technical damages on the ship in a state of alcoholic intoxication. Damages can be connected with movement along the catwalk and decks, maintenance and repair mechanisms or implementation of mooring operations. The listed kinds of works, as a rule, are carried out on a ship collectively in the composition of crews and teams. Therefore, supervisors are very strict about alcohol consumption on board. For the Navy, there are examples of collective consumption of alcohol on board of the ships. This is not only because drunk person can endanger himself but also can create an emergency situation, which could be life threatening to all crew and can lead to the loss of the ship [54, 55].

In the study of non-industrial injuries it is established, that on the way from work injuries frequency rate in a state of alcoholic intoxication, with subsequent urgent hospitalisation increased in 1.7 times ( $p < 0.05$ ). One of the injury risk factors is misuse of alcohol beverages and watch on duty or after disembarkation. Most often from non-production types of personal injuries floating crew have been hospitalised with a household alcohol injury. In the structure of non-industrial injuries the weight of this kind is the largest (78.2%), considerably exceeding the injuries during a fall on the street, in the pedestrian flows (10.3%), in transport and traffic accidents (6.7%), with intentional injuries (of 4.1%). Alcoholic intoxication leads to injuries during different sport activities (0.7%) [56–58].

The floating crew of the Northern water pool receives intentional injuries (as a rule, suicidal attempts to cause the stab wounds) reliably in a state of alcoholic intoxication ( $p < 0.001$ ). On the first place among the most commonly found out is the situation, which the victims themselves define as: "...beaten up by unknowns in the street". Their percentage is 39.7% of the total amount of injuries received in a state of alcoholic intoxication. That is, every two out of five of alcoholic injuries received when establishing personal relationships. Floating crew in these situations was sometimes, as in the role of victims, being sober, and in the role of defenders of victims of troublemakers. However, alcoholic intoxication with this type of injury is overwhelming ( $p < 0.001$ ). Often after consumption of alcohol causes various injuries in the home for a variety of economic activities, falls on the street and from height, driving vehicles under the influence of alcohol [59].

Alcoholic injuries are caused to the floating crew mostly by blunt (61.5) and sharp (16.4) objects ( $p < 0.001$ ), at least – thermal agents (0.8). The work of this contingent is in the irregular cycles during the working week. Therefore, the admission of floating crew with injuries associated with

the use of alcoholic beverages will take place during the week cycle with fluctuations from 9.6 on Monday to 13.4 on Sunday, with the highest rates in the generally accepted weekend. The autumn period is the most unfavourable in the creation of traumas danger situations. Floating crew falls on the slippery deck due to strong gusts of wind. The low temperature of the outdoor air contributes using by the floating crew significant quantities of alcoholic beverages, what often lead to a variety of damage. Therefore, in the autumn the hospitalisation for injuries received in a state of alcoholic intoxication is the highest (25.0). In the summer this percentage is lower (20.8). The lower admission of floating crew to hospital in the winter (16.8) and in the spring (17.2) is associated with the complete termination of the river navigation and the possible departure of workers to leave beyond the home port and region of residence, as well as the transition of the majority of the vessels of transport and fishing fleets for work in ice-free ports [60].

The absolute majority of injuries of floating crew in a state of alcoholic intoxication occurred in the port of registry (80.2). Therefore, parking in the native port costs workers of vessels especially big losses. The number of injuries in a state of alcoholic intoxication was significant when they were on vacation and on leave (16.6). The unfavourable situation on the alcohol injury with short stops at the port stresses the importance of the organisation of rest and leisure of floating crew not only at the level of the production team or the vessel, but also the family. Often the traditional way of eating with drinking, meeting and seeing are the bases for creating a dangerous situation for injuries in a state of alcoholic intoxication, which not only often accompanies the injuries of floating crew, but also increases the weight of his character [61, 62].

The specific weight of damage in a state of alcoholic intoxication in the structure of isolated injuries (55.0) is 31.3% of the observations, while poly injuries (26.0) – 45.9% ( $p < 0.001$ ). The first significantly dominates over the second [63]. This relationship remains in the group of injuries received in a state of alcoholic intoxication, but the probability of it is reduced three times, while remaining statistically significant. Isolated injuries are characteristic for a sober seafarers, while poly ones accompanied by alcoholic intoxication ( $p < 0.001$ ). Among the last more severe combinations of injuries prevailed over the ones received without alcohol. Alcoholic intoxication plays a main role in receiving heavy injuries [64].

The severity of conditions of the victim and the multiplicity of injuries express alcoholic intoxication, which masks the clinical picture, makes it difficult to examine the victim and diagnose all damage, and poses a complex tasks in front of the surgical team. Often in multiple injuries on the background of the expressed intoxication provision of

emergency assistance should be conducted as if the combined injuries, considering alcoholic intoxication as a factor of endogenous effects on the body of the victim [65, 66]. The floating crew, who had received injuries in a condition of alcoholic intoxication, most frequently had fractures in various bones (27.7). The second place is occupied by the wounds, followed by the traumatic brain injuries, bruises, frostbites, burns, and traumatic amputations of the fingers. It is important to emphasise that floating crew get the frostbite only in a condition of alcoholic intoxication [67, 68]. Localisation of alcoholic injuries is of great importance in determining the volume, the halting pace of emergency care at the scene of an accident during transportation and of the forces and means of the medical service, aimed at the rehabilitation of victims (Table 3) [69, 70].

Floating crew has most often been hospitalised in the surgery department due to cranium-brain injuries. Among 1281 patients with this kind of injury there were 611 with alcoholic intoxication (47.7%). Closed cranial brain injury: concussion of the brain has been the 38.2% of the alcoholic damage and prevails over the wounds of the head and bruises. These three types of injuries are dominant, they account for 73.9% of all damages to the head. The second rank place in the frequency of damages in a state of alcoholic intoxication of floating crew takes the shin. Among them there are the main types of bone fractures of the tibia – 95.2% (10.3). Among the injuries of the chest of floating crew in state of alcoholic intoxication the most frequently occur wounds of the thorax (2.3), bruises (2.3), as well as penetrating wounds of the chest and fractures, as a rule, of two ribs (1.3). The most severe type of damage wounds, penetrating wounds of the chest, as with damage to internal organs, both with and without such floating crew receives mainly in a state of alcoholic intoxication [71]. Very typical for alcoholic injuries is the prevalence of 1.8 of the surface wounds and wounds with severe bleeding which require surgical treatment. The injuries of median nerve are frequent for alcoholic injuries of the forearm. From 384 hand injuries only 84 (21.9% of the cases) were accompanied by alcoholic intoxication. These are characterised by damage of tendons of muscles flexors and extensors of the fingers (2.3). On the sixth rank place in the frequency of damage in a state of alcoholic intoxication are abdominal injuries. Patients are treated in hospital over the wounds of the anterior abdominal wall, as well as the bruises. The absolute majority of the wounds of the abdomen with damage to the internal organs has been received by floating crew in a state of alcoholic intoxication. Hospitalisation in the surgical department with the thigh injuries received in a state of alcoholic intoxication in case of fractures of the hip bone (1.7) occurs two times more often than due to the wounds (0.6) and fractures (0.8). Damage to the spinal column, re-

**Table 3.** The frequency of the Northern water pool floating crew injuries received in alcoholic intoxication based on the surgical department depending on the location (on the 1,000 workers  $P \pm m$ )

Localisation	The influence of alcohol	Without the influence of alcohol
Head	982.6 $\pm$ 10.0	576.5 $\pm$ 6.5
Shins	280.1 $\pm$ 6.8	337.9 $\pm$ 5.4
Thorax	219.5 $\pm$ 6.2	121.2 $\pm$ 3.4
Forearm	168.6 $\pm$ 5.4	104.8 $\pm$ 3.2
Bones	135.0 $\pm$ 4.9	258.5 $\pm$ 4.8
Abdomen	114.9 $\pm$ 4.6	34.4 $\pm$ 1.9
Thigh	81.1 $\pm$ 3.8	56.1 $\pm$ 2.4
Spine	64.3 $\pm$ 3.4	83.2 $\pm$ 2.8
Foot	54.0 $\pm$ 3.2	101.2 $\pm$ 3.2
Shoulder	33.8 $\pm$ 2.6	90.3 $\pm$ 3.0
Knee	30.7 $\pm$ 2.4	237.7 $\pm$ 4.6
Collarbone	33.8 $\pm$ 2.6	81.5 $\pm$ 2.8
Pelvis	27.1 $\pm$ 2.3	16.4 $\pm$ 1.3
Neck	13.4 $\pm$ 1.6	5.5 $\pm$ 0.7

ceived by floating crew in a state of alcoholic intoxication is characterised by reliable prevalence of fractures (1.9). The prevalence of fractures observed among damage foot in a state of alcoholic intoxication, in this case occurs two times more often than the wounds. Getting sober after alcohol consumption reduces number of amputations [72, 73].

Among damage of the upper extremity, received by floating crew in a state of alcoholic intoxication, dominated wounds with the damage of major vessels, nerves and tendons. And, with the injuries of the lower limbs fractures from 54.1% among damage hips up to 95.2% of the tibia. The 53.5% of patients who received damage in alcoholic intoxication underwent surgical interventions, including: primary surgical treatment (30.2%), intra operative mapping of bone fragments, followed by the imposition of metal for bone synthesis or compression-distraction devices – 23.3%. Surgical treatment has been 1.3 times more often performed in patients who received injuries in a state of alcoholic intoxication (24.6), while in case of injuries of floating crew received in a sober state 2.9 times more often there were executed transactions on the bones. In the case of damage in a state of alcoholic intoxication, the period of hospitalisation has been 0.2 per bed-day more and amounted to 17.3 days, while in case of traumas in a state of alcoholic intoxication, the number of disabled persons among the crew has been 1.4 times more, and the number of deaths has been two times higher [74, 75].

The fishermen have been a professional group of floating crew, subject to the high social vulnerability to the alcoholic beverages consumption and related injuries [76, 77]. The analysis has covered the 372 injured fishermen,

having received damages in a state of alcoholic intoxication and exceptional treatment in the surgical department. Among the affected fishermen were the representatives of all life support services of the vessel, but more than half were members of the service operation. The combination of the use of ethanol and injuries in the fishing fleet of crew differed from the sailors – 42.8%, minders – 28.9%, fish processing masters – 8.8%, mechanics – 7.7% and cooks – 5.0%. Most alcoholic injuries of floating crew have occurred in the non-production environment (96.6%). The situations, in which fishermen after alcohol consumption have been injured, have been very diverse. However, it should be noted that for them the most characteristic lesions occur in clarifying personal relationships, at home, due to the falls on the street at the pedestrian movement, falls from a height, transportation and traffic accidents [78]. In the autumn period, the majority of fishermen injuries have been connected with the use of ethanol. In the winter the number of injuries decreased by half, and in the spring and summer gradually increased. The maximum number of injuries in a state of alcoholic intoxication fishermen received on Sunday (39.3), Friday (16.9%) and Wednesday (16.3%). The fact that half of alcoholic injuries accounted for three of the last days of the week, once again emphasises the non-productive character of alcoholic injuries of fishermen. Fishermen have received injury in a state of alcoholic intoxication during the mooring of ships in the ports (73.8%), on holidays and at the weekend days (25.6%). Parking the vessels in ports should be fairly dangerous to injury in a state of alcoholic intoxication. Multiple injuries of the fishermen are connected primarily with the use of ethanol. Among ones accounted for 66.0% of the

cases are multiple, 32.1% — are combined and 1.9% — are the combinations of injuries. Severe injuries in connection with alcohol intoxication is two times more higher than in fishermen not using alcohol [79, 80]. The main reasons for hospitalisation were as follows: wounds, fractures, closed head injuries, such as concussions and brain contusion. Of these, more than half of the fishermen have been in a state of alcohol intoxication. The structure is dominated by injury or concussion of seafarer injury, combined with fractures of the lower jaw. For the injuries of hand and forearm there is particularly high probability of bone fractures, and shoulder — injuries and habitual dislocation. Injuries such as clavicle fractures often end as tears of the acromioclavicular joint. Injuries of the chest due to the the influence of alcohol in most cases lead to bruises and injuries than broken ribs. Injuries to the lower extremity have mostly been seen in the structure damage of various anatomical and functional segments of the bones. Fractures of the spine, pelvis and legs were accruing only among drunk seafarers. In the treatment of alcoholic injury, the fishermen significantly higher required surgical treatment, including: primary treatment of wounds or other types of interventions. Recovery occurred in the 96.3% (fishermen do not consume alcohol — 98.4%), and II disability group has been established in 3.9 times more often [81–83].

## DISCUSSION

The studies have conclusively shown that alcohol intoxication is a major social factor determining the character of injuries of floating crew of the Northern water pool. The specific weight of hospitalised injuries received in a state of alcoholic intoxication varies on different fleets from 28.7 to 39.3%, which testifies to the strongly pronounced dependence of accidents and consumption of alcohol. Men with lesions in a state of alcoholic intoxication are hospitalised 6 times more often, than women of this contingent. The frequency of hospitalisation is highest between persons aged 20–29 years. For each fleet age of hospitalisation in a state of alcoholic intoxication, has been declining steadily, reaching the lowest in the merchant older than 50 years. Masters of fish production, sailors, minders, captains and mechanics are hospitalised more often than other specialists. In total, for the basin deck officers and engineers all three main fleets will be hospitalised at the clinic more often than the command.

The surgical hospital medical assistance is provided mainly to the non-injury (relating to production of 10:1), including household, falls on the street at the pedestrian traffic, transport and traffic accidents. The main types of damages in a state of alcoholic intoxication of floating crew are: fractures, wounds, traumatic brain injuries ,damaged head, leg, chest, and arm. Injuries in a state of alcoholic

intoxication are mainly of multiple and combined nature. For alcoholic injuries there is the considerable damage to the deep anatomical and functional structures: a significant damage to the soft tissues, excessive bleeding, damage to deeper located nerve trunks, vessels, in case of damage of forearm and hand — tendons flexors and extensors of the muscles. Therefore, the operative intervention is required in 53.5% of the cases, and primary surgical treatment in 30.2%. In case of injuries of floating crew received in a state of alcoholic intoxication, the number of adverse outcomes with the definition of disability groups exceeds 1.4 times, and fatal — 2 times.

Provision of emergency assistance of floating crew when injured is the ship's medical staff, while sites — personnel of the port health posts and dispensaries and the brigades of ambulance. Knowledge of the peculiarities of injuries, the typical locations of damage to the merchant in a state of alcoholic intoxication allows to clearly define the scope of medical actions that require the site of the accident and medical forces and means necessary for the transport of the injured to the hospital. The struggle with the traumatic shock, alcohol intoxication, necessary and sufficient immobilisation and urgent evacuation of patients to medical institutions decides their fate, specifies the terms of rehabilitation and return to work as floating crew.

Improving the system of injury care in the crews is primarily due to the organisation of the work of the ship's doctor. Hygienic and alcohol education is to promote healthy lifestyle among the seafarers. Promoting healthy lives of seafarers should be conducted on an individual, group, team and industry levels. A specific embodiment of the principles of preventive medicine is the clinical examination of the direction of crew, which is a combination of preventive and therapeutic measures, which includes: pre-periodic annual inspections of the crew, check-up between cruise periods, disability examination and rehabilitation.

## CONCLUSIONS

1. Among floating crew of the Northern water pool the received injuries on a ship, in a state of alcoholic intoxication were 8.1% of the victims, including the transport fleet — 8.9%; fishing — 8.9% and river ones — 4.1%.
2. The floating crew revealed a tendency of increasing the frequency of injuries in the state of alcoholic intoxication in the older age groups. The most frequently injured after the consumption of alcoholic beverages have been masters of fish production (44.9 from 1000), skippers (33.7 from 1000), heads of radio stations (30.0 from 1000), masters of fish processing (25.2%). High risk groups were the sailors and the boatswains (14.0), minders and navigators (13.1), mechanics (11.6) and cooks (8.8). More often accrued

among seafarers with work experience not exceeding 1 year (29.1).

3. Injuries in a state of alcoholic intoxication occurred during transitions along the catwalk and the decks (54.2%), mooring operations (15.1%), maintenance and repair of deck machinery, water preparation (6.6%), as well as boat and loading-unloading works (4.3%), that is the ship's papers, which are most frequently met in the preparation of the vessels to the departure and approach to the mooring lines. A significant number of alcoholic injuries (36.6%) were due to falls from a height. Alcohol intoxication in 3.2 times increases the weight of the combined traumas.
4. Among the ship's alcoholic injuries dominate traumatic brain injuries, accompanied by the concussion of the brain, the fractures of the bones of the base and of the vault of the skull, bruises and wounds of the soft tissues of the head. The upper extremities fractures are more than 61.0% of all damages lower 24.0–43.0%; open constitute 26.0% of them. In burn injury in a state of alcoholic intoxication floating crew mainly receives thermal destruction of the II degree from 3.2% to 10.0% of the surface of the skin with the localisation on hands, feet, front abdominal wall. The fatalities and injuries in a state of alcoholic intoxication (43.4%) significantly exceeds the indicators in the group of non-alcoholic injuries (7.0%).
5. During hospitalisation for injuries in the surgical clinic drunkenness has been noted in 35.0% of cases in the northern water pool of floating crew, including: 28.7% – transport fleet (53.5), 39.3% – fishing fleet (78.8) and 28.9% – river fleet (46.6), indicating a pronounced dependence of the accidents and the use of ethanol in these contingent transport workers. Men in their number of floating crew have been hospitalised for alcohol injury to 6 times more often than women.
6. Hospitalisation of the floating crew of the northern water pool for injuries to alcohol intoxication produced under production conditions according to the ship's data (6.1) are 10 times less likely than non-productive (60.7). In the structure of non-production injuries due to of alcoholic injury, the proportion of household injuries is significantly higher (78.2%) than injuries in falls in the street, with pedestrian traffic (10.3%), in transport and road accidents (6.7%), with intentional injuries (4.1%), sports games and contests (0.7%).
7. Fishermen are a professional group of floating crew subject to the highest social vulnerability of drinking and associated injuries. Alcoholism among fishermen leads to different injuries, long rehabilitation and poor prognosis (if compare with transport crew and river fleets of the Northern water pool).

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**EDITORIAL COMMENT:** Pilot study. Statistics, interpretation and conclusions on Author's own responsibility.