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MODERN TRENDS IN MARINE HEALTH, STUDY OF HEALTH OF SEAFARERS AND MARITIME
MEDICAL SERVICES IN GEORGIA

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საზღვაო ჯანდაცვის თანამედროვე ტენდენციები, მეზღვაურთა ჯანმრთელობისა და საზღვაო
სამედიცინო სერვისების კვლევა საქართველოში
თბილისის სახელმწიფო სამედიცინო უნივერსიტეტი

რეზიუმე

კვლევა მიზნად ისახავს: ჩამოაყალიბოს საზღვაო სამედიცინო სერვისების სისტემატური სტრუქტურა/მომსახურების მიწოდება, გამოავლინოს მეზღვაურთა ჯანმრთელობის მნიშვნელოვანი ფაქტორები და გაზომოს მათი შედარებითი მნიშვნელობა პოტენციური თანამშრომლობისთვის. ჩვენი კვლევის შედეგებმა მნიშვნელოვანი დასკვნების გამოტანის საშუალება მოგვცა. ამ შემთავაზებული სისტემის მთავარი მიზანია უზრუნველყოს კეთილდღეობა და საუკეთესო სამედიცინო დახმარება საზღვაო ინდუსტრიაში ღირებული მეზღვაურებისთვის [6]. შემთავაზებული სერვისების განხორციელება გამოიწვევს: მეზღვაურთა ჯანმრთელობის ეფექტურობის გაუმჯობესებას ორგანიზაციული გაუმჯობესების გზით; შემცირებული ზარები პორტში; შემცირებული ავადობა ოფშორში და ხმელეთზე; მეზღვაურის აქტიური პროფესიული ასაკის მატება; სამედიცინო შემთხვევების ეფექტური მართვა, რაც გამოიწვევს ხარისხის გაუმჯობესებას; რაც გამოიწვევს სადაზღვევო კომპანიების და სხვა გადასახადის გადამხდელის ხარჯების შემცირებას და, შესაბამისად, სადაზღვევო პრემიების შემცირებას; შვებულების დროის შემცირება, ასევე როტაციის სიხშირე და ღირებულება; პორტში სასწრაფო დახმარების გამოძახების რაოდენობის შემცირება; ჯანმრთელობის ხარჯების ოპტიმიზაცია; სააგენტოებში კვალიფიციური კადრების აყვანის/დაკომპლექტების სიმარტივე; მეზღვაურის გაზრდილი ლოიალობა კომპანიის მიმართ; კონკურენტუნარიანობის ამაღლება საზღვაო შრომის ბაზარზე.

Introduction: At the present stage, there is a growing trend in the world in terms of marine medical services. Marine health is a new approach. The fast-growing, dynamically evolving maritime industry demands modern, well-organized and efficient medical services for its key consumer sailors and their families.

Marine medicine has made significant contributions to the development of marine health. Maritime medicine has been defined as "any medical activity related to the employment of seafarers, working conditions, living conditions, health and safety" [1].

The Marine Medicine Handbook [2] states that several factors have had a dramatic impact on seafarers' health over the past three decades. This includes the globalization of the shipping industry, the increase of automation and mechanization in the workplace, the improvement of navigation equipment, the reduction of the number of crews, etc. Research in the healthcare sector mainly addresses the determinants of healthcare. Thus, we considered it necessary to analyze the maritime medical services [3]. In the modern period, the analysis and professional evaluation conducted over the last few years have shown that the organizations of different types of maritime medical services are not systematic. Finding the best practical solution is still a matter of consideration for maritime industry experts and organizations over the last few decades. In the framework of our research, we can identify thematic specific factors that are relevant and relevant: access to health services; provision of medical services and integration; TV health; Non-communicable diseases and physical health problems; Transmitted diseases; Psychological functioning and health [4]; Safety issues. Will sailors and their family members attach

importance when choosing a clinic. The study identified the need for more research on sailors' psychosocial and cultural issues. On tele-health and the development of a stronger systemic perspective to promote the health of seafarers [5].

The present study aims: to establish a systematic structure / service delivery of marine medical services, identify important seafarers' health factors, and measure their relative importance for potential cooperation.

Methods: Study population and data collection instrument: The survey was conducted in one stage, over a fixed period of 12 months, using a survey method in St. Petersburg. Batumi JSC Naval Hospital. The selection of sailors and their family members was carried out by the method of cluster randomization. The health status of 150 sailors aged 22 to 55 years and their family members (150 respondents interviewed) was studied.

Results: The survey of respondents revealed that - after 45 years, more than half of the sailors surveyed had chronic diseases. The same trend was observed with regular medication: more than half of sailors over the age of 45 normally took at least one medication per day. It is noteworthy that it was also present in 40% of 35–44-year-old sailors.

In terms of chronic diseases, especially high were cardiovascular (more than 70%), musculoskeletal (up to 60%), metabolic (up to 45%), gastrointestinal (up to 35%), respiratory (up to 25%), neurological (up to 20%), Allergic (10%), in other cases other chronic diseases were observed.

We conducted an empirical study, theoretical generalizations of the issue in the outpatient cards reflecting the practical services provided to the seafarers.

A study of the health status of age groups revealed that with increasing age, frequent illness increases, chronic diseases increase, hence the number of sailors who take the drug daily. There was no statistically significant difference in psychological problems between the groups in our material with increasing age, as indicated by the X² and P rates (Table 1).

Table 1. Distribution of surveyed contingent by age

Age groups	Total							X ²	P
	20-25	26-30	31-35	36-40	41-45	46-50	51-55		
Frequent illness	8	11	11	14	14	16	19	0.092	0.761
Psychological problems	12	12	11	14	12	13	13	0.412	0.520

The study also examined the effects of healthy eating, physical activity, alcohol and tobacco use (smoker / non-smoker) on common illnesses (health problems) by seafarers' age groups.

According to our data, with increasing age, tobacco and alcohol consumption, unhealthy lifestyle, are correlated with health problems (Table 2).

Table 2. Impact of healthy eating, physical activity, alcohol consumption, tobacco (smoker / non-smoker) share on frequent illness

Classes	Age Groups	Total	20-25	26-30	31-35	36-40	36-40	36-40	51-55	X ²	P
I	Healthy Eating	87	7	10	13	15	14	14	14	0.127	0.721
II	Physical activity	70	15	14	12	9	8	8	4	5.960	0.065
III	Alcohol Consumption	127	6	8	8	12	13	8	7	3.028	0.081
IV	Tobacco	127	16	18	18	20	19	19	17	6.794	0.09

Discussion: The results of the research show that in order to improve the quality of seafarers' health services, based on the analysis of our research, it is necessary to create an all-inclusive system that combines existing and new services with resources.

Some of the key components of the above system are: PEME (Preliminary Medical Examination) Clinics; TMAS (Tele Maritime medicine Assistance Service) centers; Port Medical Facilities / Referral, Specialized Hospitals - Management of Medical Cases; Information about health / promoting a healthy lifestyle.

Analysis of our research shows that the situation in marine health is unfavorable. The identified problems can be grouped according to the four components of the system mentioned in the paper:

1) PEME CLINICS - No specific criteria for selection and approval of PEME clinics are defined; There is no diverse scale and therefore the cost / price of a medical examination before hiring sailors; There is no unified database of seafarers' health records; PEME clinics are not informed about on-board medical cases; No post-employment medical visits for seafarers are carried out after the end of the contract; PEME physicians are not actively involved in health promotion programs for seafarers and their families, promoting healthy lifestyles and raising health awareness; There is no unified matrix for continuous professional development of PEME physicians; Lack of external (second opinion) support from PEME physicians for complex and complex medical cases.

2) TMAS -The crew uses TMAS medical services only in severe emergencies, which accounts for 2-3% of the total number of medical cases. TMAS collects information about medical problems from non-medical staff and does not have access to seafarers' past medical history records. Lack of communication between TMAS and other involved health care providers, leading to delays / termination cases [9].

3) Port Medical Institutions / Referral Hospitals - Medical Case Management. After the evacuation in the port city, the medical case is managed by the local clinic in accordance with its standards and protocols; The same applies to the transfer of a seafarer to a medical facility in the country of residence; The shipowner does not receive any medical information other than the summary of the case after its completion; Referral clinics do not have access to medical history records, which may affect the effective management of medical cases; Lack of communication between referral hospital and PEME clinics during medical case management.

4) Raising health awareness / promoting a healthy lifestyle. There is a low level of healthy lifestyle awareness among sailors, which increases the risk of illness and the cost of treatment, leading to a decrease in active working age and labor productivity.

Based on the analysis of the information obtained from the conducted studies, it is possible to formulate the expected results after updating the system. We propose the introduction of a systemic approach based on services aimed at optimizing and integrating key medical components. The proposed structure implements standard operating procedures (SOPs) and protocols designed in line with CSM (Continuous Service Management (Software)) business processes built into the Cloud Technology Information Management System (HIMS) with its main component - Electronic Medical Records (EMR) [7]. Needless to say, all data is stored and managed at the highest level of security at any stage of database access.

Conclusion: The results of our research have enabled us to draw important conclusions. The main purpose of this proposed system is to provide welfare and the best medical care for valuable seafarers in the maritime industry [6]. Implementation of the offered services will result in: Improving the effectiveness of seafarers' health through organizational improvement; Reduced calls to port; Reduced morbidity offshore and onshore; Increasing the active professional age of a sailor; Effective management of medical cases that will lead to quality improvement; Which will lead to a reduction in the costs of insurance companies and other taxpayers and, consequently, a reduction in insurance premiums; Reduction of leave time, as well as frequency and cost of rotation; Reduce the number of ambulance calls in the port; Optimizing health costs; Ease of hiring / staffing qualified staff for agencies; Increased loyalty of the sailor towards the company; Increasing competitiveness in the maritime labor market.

References:

1. Oldenburg M. Risk of cardiovascular diseases in seafarers. *International Maritime Health*. 2014;65(2):53–57. doi: 10.5603/imh.2014.0012
2. Jensen O., Charalambous G., Flores A., Baygi F., Canals M., Andrioti D. Strategies for prevention of non-communicable diseases in seafarers and fishermen: lessons learned. *International Journal of Community & Family Medicine*. 2018;3(2):3. doi: 10.15344/2456-3498/2018/142.
3. Aikaterini D., Vasileios P., Aris C., Kanella Z., Dimitris K., Efthymios K. Seafarers' health problems, emergencies, diseases and risk factors. a systematic review of the literature. 2019. pp. 43–48.
4. Mahdi S. S., Amenta F. Eighty years of CIRM. a journey of commitment and dedication in providing maritime medical assistance. *International Maritime Health*. 2016;67(4):187–195. doi: 10.5603/IMH.2016.0036.
5. Hassanalieragh M., et al. Health monitoring and management using internet-of-things (IoT) sensing with cloud-based processing: opportunities and challenges. Proceedings of the 2015 IEEE International Conference on Services Computing; July 2015; New York, NY, USA.
6. Houimli M., Kahloul L., Benaoune S. Performance analysis of internet of things application layer protocol. *Advances in Intelligent Systems and Computing*. 2019;756:225–234. doi: 10.1007/978-3-319-91337-7_22
7. Westlund K., Attvall S., Nilsson R., Jensen O. C. Telemedical maritime assistance service (TMAS) to swedish merchant and passengers ships 1997–2012. *International Maritime Health*. 2016;67(1):24–30. doi: 10.5603/IMH.2016.0006.

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SUMMARY

The present study aims: to establish a systematic structure / service delivery of marine medical services, identify important seafarers' health factors, and measure their relative importance for potential cooperation.

The results of our research have enabled us to draw important conclusions. The main purpose of this proposed system is to provide welfare and the best medical care for valuable seafarers in the maritime industry [6]. Implementation of the offered services will result in: Improving the effectiveness of seafarers' health through organizational improvement; Reduced calls to port; Reduced morbidity offshore and onshore; Increasing the active professional age of a sailor; Effective management of medical cases that will lead to quality improvement; Which will lead to a reduction in the costs of insurance companies and other taxpayers and, consequently, a reduction in insurance premiums; Reduction of leave time, as well as frequency and cost of rotation; Reduce the number of ambulance calls in the port; Optimizing health costs; Ease of hiring / staffing qualified staff for agencies; Increased loyalty of the sailor towards the company; Increasing competitiveness in the maritime labor market.

Keywords: Marine Health, TeleHealth, PEME Clinics.

