

The Global Maritime Mental Health Promotion Program

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Abstract

Background: The nautical employees face more difficult working conditions in the sea than other employees. The mental health is affected by the living conditions and long working hours that can contribute to stress, anxiety, loneliness, that again can lead to depression and suicide. The aims are to improve the seafarers' mental health by introducing a comprehensive, evidence-based global maritime mental health promotion. Further to attract the youngest seafarers to choose seafaring as their carrier and to stay for years in the job.

Methods: The theories on empowerment, life-long- and problem oriented learning with inclusion of all stakeholders form the theoretical background are applied. A joint action is established among the unions, the ship owners, the maritime authorities and a network of the universities' research centres in suicide prevention, public health and maritime health departments.

Results: A: Review studies on the prevalence of depression, quality of life, social isolation, loneliness and associated risk factors; B: Dynamic cohort studies of students from maritime academies with baseline questionnaires and follow-up after experience gained at sea and then every 5 years; C: Analysis of the etiological indicators for the drop-out rates of the students and trained seafarers; D: The training methods the maritime students, seafarers and personnel in the shipping companies in groups with problem solving and life-long learning; E: Organising the students into small groups that stay in contact while at sea and at home; F: Training the students to assist each other in difficult situations on-board and onshore; G: Giving mental health care training through classes, online courses, information materials and the obligatory health examinations.

Conclusions: Empowerment of the youngest seafarers through a multi-phased life-long- and problem oriented learning is supposed to be effective to improve the quality of life at sea. Political and international guidelines are needed to minimise those risk factors that are not cost-effective immediately.

Introduction

Shipping is the most globalised economic sector and employs more than 1,500,000 seafarers originating from various countries with different socioeconomic and cultural backgrounds. Shipping is essential to the function of the global economy and its dependence upon international trade and the resulting need to move goods from production to consumption sites. Raw materials and finished goods have been the main cargoes in international trade.

Studies on the health profile of the seafarers show worse health in almost all indicators as compared with those of the general population [1]. Standardized mortality rates show higher rates of accidents, suicides and liver cirrhosis while hospitalization records show higher rates of cardiovascular diseases, cancers, and injuries.

The seafarers face more difficult working conditions at sea than the employees working on shore. Among other difficulties, they report struggling with long periods away from their family, circular working hours, limited communication capabilities with their own social networks [2] and limited choices for healthy food and physical exercise [3]. Their health is affected by the environment where they live and work, but also by the ports, they visit during their trips. These occupational factors can have an impact on both their individual health behavior (e.g. smoking, alcohol consumption, unhealthy diet) and their exposure to occupational risks (psychosocial, biological, chemical, and physical factors) depending on ship type [4, 5]. Organizational aspects, such as unreliable contracts and long working hours, contribute to stress and depression. Depression and suicides have devastating consequences not only for seafarers' families,

but also for fellow employees and the industry. Neuropsychiatric conditions represent the second highest disease burden in DALYS on populations' health globally; among seafarers, depression and suicide rates are higher than the general population. (Roberts) In 2012, Iversen reported that from 1960-2009 among 17,026 seafarers' deaths, 1,011 seafarers died as a result of suicide (5.9%), which is more than three times higher than the respective suicide rates of the most western countries. Their findings also indicate that seafarers are 2.5 times more likely to commit suicide [6, 1, 7]. A 2015 survey by ITF highlighted seafarers' perceived physical and mental health. According to this, more than half of the sample showed signs of anxiety and depression and the main causes identified were loneliness, long separation from home and family, unreliable contracts and long working hours (ITF 2015). The research questions focus on the youngest seafarers' knowledge, competencies, their needs for training and improvement of quality life on board to prevent mental health illness and suicide. The project objectives are to improve the seafarers' mental health by planning and implementing a comprehensive, evidence-based global maritime mental health promotion program that attracts the youngest seafarers and make them stay in the job for many years.

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Methods

Theory- and evidence-based mental health promotion

The program is based on the WHO theories on empowerment and the inclusion of all stakeholders in a public health prevention strategy applied for the shipping industry. The WHO's comprehensive mental health action plan WHO 2013-2020 Action Plan calls for a change in the attitudes that perpetuate stigma and discrimination that have isolated people. The program calls for an expansion of services in order to promote greater efficiency in the use of resources [8]. This program for the shipping industry will focus on the youngest seafarers' knowledge, competencies and needs for training and for quality life on board in order to attract them to shipping and to hold on them in the future. Evidence-based medicine has developed over the last half century and was formally defined by Sacket et al. in 1996 [9, 10]. Later the evidence-based health promotion was developed to include planning interventions based on solid scientific knowledge and planning for public health programs including mental health promotion to be applied here [11]. The intention is to produce the needed scientific research for promotion of quality of life and prevention of social isolation, mobbing, harassments etc. and suicide. Experienced scientists from the university centers for suicide research and their international network will be invited to participate in the research. Scientific experts from the universities public health centers, the maritime health research centers and the pedagogical institutes will be invited to carry out the planned research tasks and intervention programs. Tenders to be announced for the specific research tasks. We searched for comprehensive programs with evaluation of the gained effect in seafaring. The PRISMA Statement was adapted for the literature review [12]. The databases, PubMed, Google Scholar, Web of Science and Cochrane databases were searched for relevant studies by the use of the search phrases: intervention AND mental health AND shipping. In all 38 studies were found but none concerned intervention for mental health in merchant shipping.

The study populations

The study populations include: the maritime students, the experienced seafarers, the employees in the shipping companies,

the maritime authorities, the maritime medical doctors, the Radio Medical doctors, the maritime school teachers and comparison groups onshore.

Project methodology

The review studies

The review study on suicide is based on national-health register cohort studies on mortality that includes suicide in shipping as compared with other workers (Table 1). Intervention study reviews are based on cohort studies in shipping and cohorts of other workers. The review study on risk factors, include single risk factors and the combinations of different risk factors, especially interpersonal and organisational factors. The review study of learning materials, include studies that have shown to be useful and effective in mental health promotion in shipping and other settings. The PRISMA Statement will be adapted for systematic reporting of review studies [12].

The cross-sectional studies

The studies will use validated standardized questionnaires. Students in 10-20 maritime schools in 10-15 countries will complete questionnaires before and after their sailing periods. Frequency and regression analysis will be used in accordance with the STROBE initiative for systematic reporting of the studies [13]. The best methods for mental health promotion discovered in the review studies will be used. Methodological support is given in the Wikiversity learning sites; the Blue Risk Survey Program and validated standardized questionnaires will be used [14] Open Blue Risk Survey Program (Table 2). Surveys on knowledge, quality of life, attitude profile and the perceived training needs. Gap-analyse, will show potential areas, for in-depth guidance of the training programs.

The cohort studies

Students from the maritime schools and academies will be enrolled in the cohort studies and complete surveys before and after being at sea. Study groups of 4-5 will form intervention study groups at the schools that will be educated in mental illness prevention and trained

The research questions	The project objectives	Project methodology
1. Is there any excess risk of suicide in the sub-sets of seafarers as compared to other groups in the working population?	1. To study the relative risk for suicide in seafaring as compared to other workers internationally.	1) The suicide review studies based on national-health register cohort studies on mortality that include suicide in shipping as compared with other workers.
2. Are there any scientific-based interventions that reduced the mental health risk factors and adverse effects on mental diseases and suicide among shipping employees and other workers?	2. To study the different intervention methods for the reduction of mental-health related risk factors, mental illness and suicide prevalence in order to select the most effective methods.	2) Intervention study reviews based on cohort studies in shipping and cohorts of other workers.
3. How is the quality of life onboard and which are the mental health risk factors in the work environment among shipping employees and other workers?	3. To study the mental-health related risk factors identified in the workplace and in free time environments in shipping and among other workers through epidemiological studies.	3) A review study of the single risk factors and the combinations of different risk factors, especially the interpersonal and the organisational factors, including Karasek's theories on control, demand, support, among other theories.
4. Which type of learning methods for mental-health promotion is effective at the schools, at sea and other jobs?	4. To study the quality of life mental-health related risk factors in the maritime schools and onboard	4) Learning materials that will be effective in mental health promotion in shipping and other settings.

Table 1: Systematic reviews, research questions, objectives, and methods.

to give support to each other whenever this is needed and to keep in close contact. They will receive an educational course of 50 hours about maritime mental health and receive brush-up sessions together with experience sharing. Surveys on their knowledge before and after the courses and the tours at sea will be conducted. The selected education and training programs and materials will be based on the literature reviews and the epidemiological studies. The education and training programs will form the basis of a strategic primary prevention program together with the monitoring of the outcomes. Regression analysis will be used in accordance with the STROBE initiative for systematic reporting of the cohort studies [13].

Result

- I. A global network for maritime mental health promotion is established in collaboration with the maritime unions, the maritime schools and the IMHA-Research network in 10–20 countries.
- II. 13 international scientific articles are published.
 - *3 literature reviews on suicide, risk factors and effective intervention studies in mental health
 - *1 literature review on scientific validated and useful training materials
 - *3 articles based on the planned cross-sectional studies

- *3 articles based on the cohort studies on the risk factors and the causes for leaving the industry
 - *2 articles on the training knowledge impact before and after the courses
 - *1 article will map mental health risks knowledge and gap analysis of the needed training.
- III. Different types of online training materials on mental health promotion will be developed.
 - IV. Standard survey questionnaires to evaluate the training in the schools will be produced.
 - V. 50 maritime schools/academies/universities in 15 countries will include compulsory scientific-based training modules on maritime mental health promotion.
 - VI. 50 training courses on mental health promotion will be completed in the maritime schools.
 - VII. 25 surveys will be executed among the students and the seafarers' union members on the knowledge, attitudes and skills on how to improve the mental-health environment.
 - VIII. 10 intervention cohort studies in different maritime schools will be completed.
 - IX. Internet-based information pages at ITF, Imha-Research pages and the network platform for the maritime schools will ensure that the learning materials will be available and updated regularly.

Research questions	Project objectives	Project methodology
5.1 What is the prevalence of self-rated: * Mental health risk factors (also mobbing and harassment in the schools) * Mental health symptom indicators?	5.1 To study the prevalence of the risk factors and the mental illness indicators.	5.1 to 5.3 will use epidemiological cross-sectional studies among different study populations in different countries. The studies will use validated standardized questionnaires. The study populations include: the maritime students, the seafarers, employees in the shipping companies, the maritime authorities, the maritime medical doctors, the Radio Medical doctors, the maritime school teachers and all other important partner groups. Students in 30 maritime schools in 10–15 countries will complete surveys before and after their sailing periods. Frequency and regression analysis will be used.
5.2 Are there any sub-sets of the population with a particularly high prevalence of self-rated risks for mental health problems?	5.2 To study the relationship between the mental health indicators and the workplace and living-conditions related mental health risk factors, the self-rated mental health, work ability and reasons for job-turn over.	
5.3 Which are the strongest relationships between the mental health risk factors related to work and living conditions and the mental health illness indicators?	5.3 To identify the statistical relationship between the mental health indicators and the workplace and living-conditions related mental health risk factors	
5.4 Knowledge, skills and needs for training How are the different employees in shipping trained and what is their knowledge and attitude about: * Early signs of social isolation, stress and mental health problems among colleagues. * The multiple causes of mental health problems * How to assist colleagues with social isolation, stress and mental health problems in acute situations * For which issues on which they need more training	5.4 To determine the actual knowledge, skills and the personal perceived training needs in mental health for maritime students, the maritime doctors, and seafarers, so that relevant continuing medical education can be developed.	5.4: Surveys on knowledge, quality of life and attitude profiles and the perceived training needs. The gap-analysis show potential areas for in-depth guidance of the training programs.
5.5 Which are the specific mental health risk factors that prompt seafarers to leave the job early?	5.5 To identify the main causes for leaving seafaring jobs.	5.5 will be addressed via description and regression analysis of the cross-sectional and the cohort studies.

Table 2: Cross-sectional studies, research questions and methods.

1. 10000–20000 maritime students will be trained every year and later all maritime students will be trained in mental health promotion and inspired for life-long learning.
2. A module book with instructions on how to carry out problem based learning with evaluations will be developed for use in the maritime academies.

Discussion

A global, evidence-based comprehensive program for mental health promotion at sea will be launched for the first time. The program will focus on the youngest seafarers' knowledge, competencies, attitudes and needs in order to attract and to hold on them in shipping in the future. The aim is to educate and to empower primarily the youngest seafarers and the different segments of employees in shipping to reduce the mental health risks and to improve the quality of life on-board. The empowerment theories and the intervention mapping for developing evidence-based health education programs constitute the main applied theories [15, 16].

The health policy includes an active participation from all significant employee segments in shipping: the seafarer doctors, the seafarers, the maritime students, the Radio Medical doctors and the staff in the shipping companies. This is in order to improve the occupational health prevention based on scientific knowledge from surveys for all segments of the employees. The training programs will be tailored for each of the specific groups of employees based on the literature reviews and the surveys in all groups of employees. The education and training programs form the basis for the strategic prevention program followed by the monitoring of the outcomes. The need for new national and international guidelines and recommendations will be disclosed to minimise some risk factors that will else not be changed due to economic factors. Decisions in the shipping company, for example the manning on-board, numeration and the competencies of the seafarers, can have a significant impact on the quality of life and the mental health environment on board.

Education and training of the whole shipping community is included in the health promotion programs with particular focus on the younger seafarers. The training teaching method will be mainly group work with problem solving. Their knowledge and attitudes will be surveyed and the gaps will form the basis of the mental health instruction to be provided. Decisions in the shipping company, for example the manning on-board, numeration and the competencies of the seafarers, can have a significant impact on the quality of life and the mental health environment on board. The youngest crewmembers are the most sensitive persons with great expectations, and they will form the future demands and criteria for the best working and living conditions at sea. It is worth to note that studies of mental health risk factors in shipping and no studies at all are seen for maritime schools.

Problem based and lifelong learning

Problem-Based Learning (PBL) is a pedagogical approach that could be an excellent way of learning mental health promotion in the maritime academies. Learning is driven by open-ended problems with no one right answer [17, 18]. Students work as self-directed, active investigators and problem-solvers in small collaborative groups (typically of about five students). Rather than having a teacher provide facts and then testing students' ability to recall these facts via

memorization, PBL attempts to get students to apply knowledge to new situations and are asked to investigate and discover meaningful solutions. The term lifelong learning is a term that aims to put learning in a broader perspective than schooling. Learning can be seen as something that takes place on an ongoing basis from our daily interactions with others and with the world around us [19]. Modules on how to do problem based learning, group works and lifelong learning, will be developed to be used in the maritime schools mental health promotion courses. The aim is to enhance critical appraisal, skills in literature retrieval, evidence based health promotion that encourages continuous learning in a team environment.

It is a special strength that the program will be performed in joint action among the ITF, the local union representatives, the IMHA-Research and the network of the maritime schools, including the cadets and the more experienced seafarers. The program for health promotion in shipping, like The International Seafarers Welfare and Assistance Network (ISWAN) [20], does not include a scientific health promotion and evaluation like in this project. Neither are the program targeted at the youngest seafarers the maritime schools and the universities. Moreover, the previous programs were not based on sound scientific research, they had no evaluation of the effects, and they were not supported by the strongest workers organisation, the ITF. None of the existing maritime organisations, including the MLC 2006, the IMO, and the national maritime authorities, have launched evidence-based programs for mental health promotion in shipping.

This program is therefore outstanding primarily by filling out the gap of mental health research based promotion, in the maritime industry. The basic target population is the youngest seafarers with the intention to train them at the maritime schools in mental health promotion. The training will be in groups of 3-5 with problem solving. The groups will stay in contact at the school and while out at sea the first times and later in life. They will be trained to identify the risk factors and how to solve the problems to maintain an attractive and healthy working environment on board to promote a supportive mental health environment. The network of ITF officers who are dedicated to improve the seafarers' health and decent working conditions will lead the program in collaboration with the IMHA/Research group. The inclusion of the network of the universities through IMHA-Research is another important asset for an evidence-based mental health promotion network. A specific network for mental health in shipping organised by ITF with high quality teaching materials will allow for global support. This will promote relevant training of all sub-groups in the maritime industry.

Strengthening the network coordination

The maritime schools and all stakeholders will have access to the learning materials developed for global use. The web-based information pages at ITF together with the Imha-Research Wikiversity pages will be the main information platform. One of the participating universities with proved experience in similar international projects will undertake the financial administration together with the ITF. A steering group representing all Network groups will undertake the running coordination. One of the participating universities with proved experience in similar international projects will undertake the financial administration together with the ITF. In kind assistance will be given in data collection for the research, training activity as part of the schools' curriculum and data collection as part of the students' thesis for example.

1. The maritime students will by themselves establish the strong networks through the social media and the maritime schools. The maritime school epidemiological cohorts are needed of scientific reasons but this will also enforce the networks. The millennium generation represent a vulnerable group for health and safety with specific demands for the mental health environment in shipping and they will know how to express their needs.
2. The global network of national maritime unions will be established through the ITF with the objective for mental health promotion. This will strengthen mental health promotion internationally and pave the way for conducting long-term intervention cohort studies and training in mental health promotion for seafarers and all professionals in shipping.
3. The network of the teachers in maritime schools will be established. All teachers in the maritime schools will be trained in mental health promotion. A permanent international Board of Maritime Schools will be established to disseminate the training materials throughout the entire shipping industry over the next 10 years.
4. The IMHA/research network with skilled researchers from the universities' research centres in suicide prevention, public health and maritime medicine undertake the research projects, help to develop the training materials and be teachers in the training courses.
5. The shipping companies, the unions, the maritime authorities and seafarers' medical clinics will be asked to help with the list of mailers for the cross-sectional studies. They will also be asked to help develop the training materials and to develop training courses for their employees, some will be in kind.
6. The international maritime organisations and the national governments will recommend that 1–2 % of the training in shipping is dedicated to training in mental health promotion. They will recommend that the external environments to be adequately adjusted for optimal mental health promotion in shipping.

Conclusions

The aim is to educate and to empower primarily the youngest seafarers and the different segments of employees in shipping to minimise the mental health risks and to improve the quality of life on-board. The planned research program will enable for a strategic evidence-based mental health promotion in the context of the international recommendations and the national authorities' adequate regulations.

Empowerment of the young seafarers through life-long- and problem oriented learning is used. The policy implications emanating from the program will request adequate training programs in mental health tailored to all sub-sets of employees in the shipping industry. The comprehensive descriptive and analytic research enable for a successful strategic mental health promotion, minimizing the mental health risk factors. Political decisions and international guidelines are required to minimise the risk factors that will not otherwise be changed due to economic factors.

Competing Interests

The authors declare that they have no competing interests.

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