O R I G I N A L   A R T I C L E

Survey on smoking habits among seafarers

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Summary. *Background:* Populations living in stressful environments experience higher mortality from lung cancer and chronic diseases. Work-related stress was identified as important determinant of smoking together to health problems caused by a incorrect lifestyles. Aim of the work was to analyze tobacco smoking addiction in seafarers working on merchant ships. Only a few studies are available on this topic. *Methods:* The survey was conducted using an anonymous questionnaire. The total number of questionnaires filled-in was 1478, out of 2000 distributed (response rate 73.9 %). *Results:* About half of the sample (55.07%) has never smoked, the 28.96% is currently a smoker, while 15.97% of responders belong to the category of ex-smokers. Analysis of the number of cigarettes smoked every day based on the rank shows that captains and officers smoke more cigarettes than the crew members who smoke 10 cigarettes maximum per day. Analysis of the level of dependence among the smokers group by the Fagerström Test for Nicotine Dependence (FTND) revealed that a 89.0% of sample has a low/very low dependence level, and only the 10.98% of the sample show a high/very high dependence. A further analysis of the results of FTND in the different age groups has shown that the 41-50 and 51-60 age groups have high dependence levels. *Conclusions:* Working on board is associated to a high risk for chronic, lifestyle-related diseases, due also to lifestyle behaviours. This study suggests to further investigate the presence of other risk factors such as diet, physical exercise, combined with tobacco smoking, obesity. (www.actabiomedica.it)

Key words: seafarers, smoking habits, nicotine addiction, lifestyles, prevention, public health

Introduction

World Health Organization (WHO) has estimated that tobacco use, smoking and smokeless is currently responsible for the death of about six million people across the world each year with many of these deaths occurring prematurely (1-6), and tobacco-related diseases even claim more lives than AIDS, malaria and tuberculosis combined (7).

Active smoking and involuntary smoking have been reported to be associated with the development of many forms of cancer, cardiovascular diseases, chronic obstructive pulmonary disease (COPD), complications of pregnancy, sudden infant death syndrome, etc (8-10).

Populations living in stressful environments, smoke more heavily and experience higher mortality from lung cancer and chronic obstructive pulmonary disorder. Stress in general and work-related stress in particular were identified as important determinants of smoking (11, 12) together to health problems caused by a lifestyle based on incorrect knowledge towards food, drugs, alcohol (13-16).

Research on the relationship between working

conditions and smoking has demonstrated that smoking and occupation are related each other and that work–family conflict may be associated with increased levels of smoking (17-19). Other studies have found significant relationship between working time and smoking (20-23).

Seafarers are often represented in popular literature as heavy smokers and drinkers. Fishermen and merchant seamen are markedly subject to alcohol and cigarette consumption.

Addiction is common among seafarers as well as increased risk of occupational accident in this population (24). Many factors favor the use of drugs in seafarers: geographical remoteness, social isolation, stay on the ship, dangerous situations, stress, sleep disturbance, etc. The search for positive effects such as the stimulant effect in the fight against fatigue, or negative, as in escape from stressful situations is therefore important for seafarers. Stressful situations affect often seafarers living in an isolated and hostile environment, which involves high risk and requires vigilance and rapid reactions. For example, the use of alcohol or drugs represents a risk factor for occupational accidents, particularly fatalities, and premature deaths (25-29). For fishermen, mean voyage time has been significantly associated with nicotine dependence. The number of days spent at sea during the past 12 months has been significantly associated with nicotine dependence (25).

Health problems of seafarers can be caused both by their occupational exposure (e.g. kind and frequency of contact with hazardous substances, stress level onboard) and by lifestyle-related behavior (smoking, alcohol) (30) or incorrect eating habits (31-34). Even the misuse of drugs can sometimes cause serious allergic effects (35-40). The seafarer's cigarette consumption is considered as an important CVD risk factor higher than in the general population (41).

Besides accidents and work-related injuries, severe CVD represent a main cause of death, both in general population from industrialized countries as well as in seafaring population (42). These findings were also confirmed by the investigation on the main causes of death on board ships assisted by Centro Internazionale Radio Medico (C.I.R.M.), the Italian Telemedical Maritime Assistance Service (TMAS) (24). Working at sea is associated with specific psychosocial stressors (including long-time separation from the family, mental stress, extremely long working hours, permanent changing crews, reduced duration and quality of sleep on board, irregular working time, and permanent physical impacts such as ship movements, noise and vibration) (42). The additional effect of adverse lifestyle factors such as smoking, sedentary lifestyle, and obesity, which is also prevalent among seafarers, is regarded as multiplicative factor (43-45).

This paper has analyzed the problem of tobacco smoking addiction in seafarers working on merchant ships. Only a few studies are available on this topic, dealing with this issue and they refer to French, Spanish, Greek, Italian, Polish, Scottish and Turkish seamen (46-52). Analysis was done on a sample of seafarers working for three Italian (Finaval, D'Amico and Carboflotta), and one French (CMA CGM) shipping companies, investigating not only the tobacco smoking addiction among seafarers but also their level of knowledge and awareness of the risks for health.

Materials and methods

Study population and data collection: The survey was conducted among seafarers of the shipping companies above described, using an anonymous questionnaire. The questionnaire was sent to 80 vessels (with an average of 25 seafarers on board, for a possible sample of 2,000 people as a sample for the interview). Each seafarer received a sealed envelope containing a letter explaining the purpose of the survey, the questionnaire and instructions on how to fill in it (53). The questionnaire validity was tested by administering it to seafarers of different rank to evaluate the "face validity". The questionnaire was distributed after health education interventions (seminars) designed to make seafarers aware of health risks linked to incorrect lifestyles, with the aim to improve the working conditions quality, and occupational safety on board ships.

The questionnaire was completely anonymous and filled only on voluntary basis. After completing the questionnaire, each participant was requested to return it in its original envelope and seal without marking. All closed envelopes were gathered by the captains and

then sent to the Epidemiology group of University of Camerino (UNICAM) for data analysis. The study was conducted according to the Helsinki Declaration.

Survey tools: The questionnaire included three parts. The first one was centered on seafarer's personal data (sex, age, nationality, education and rank), and asked questions about the awareness of injuries and diseases caused by tobacco smoking, habits and life-style. The second part was for current smokers only and included specific questions about tobacco consumption (e.g. at what age did you begin smoking? How many cigarettes do you smoke? Do you currently want to quit smoking?), and tobacco addiction. In this section, the degree of nicotine dependence in current smokers was also assessed by the Fagerström Test for Nicotine Dependence (FTND) (54). The Fagerström Test is composed of six items. Questions requiring an answer yes/no are scored from 0 to 1, whereas multiple-choice items are scored from 0 to 3. The items are summed to yield a total score of 0-10. The global Fagerström score assesses the intensity of physical nicotine addiction: low dependence (0 to 2 scores), medium dependence (3 to 4 scores), high dependence (5 to 6 scores) and very high dependence (7 to 10 scores). A score of ≥ 6 was considered as a cut-off to asses a high nicotine dependence (55). The last part of the questionnaire examined ex smokers and how they manage to quit smoking (in this paper, only current smokers will be examined).

Before the distribution, the questionnaire was validated by a previous pilot study performed on 12 seafarers working onboard cargo ships. This to assess its face validity (56).

Analysis: Questionnaire answers were transferred into Microsoft Excel sheets. This software was used for data storing and processing. Statistical analysis was performed by the X-L stat software (57). Descriptive statistics were used to analyze the distribution of variables. Qualitative data were described using frequencies and percentages. The Chi-square analysis and the Odds Ratio, to evaluate the differences between ages, rank, educational level, alcohol use and tobacco dependence level, has been applied. The level of statistical significance was set at $p<0.05$.

Results

The total number of questionnaires filled-in was 1478, out of 2000 distributed (response rate 73.9%).

Table 1 shows the socio-demographic characteristics of the sample.

About half of the sample (55.07%) has never smoked, the 28.96% is currently a smoker, while 15.97% of responders belong to the category of ex-smokers. A great part of the sample (92.8 %) is aware that smoking cigarettes, or other tobacco products, seriously compromises health. Among the main risks associated with tobacco smoking, lung cancer was indicated by the 92.02% of participants, followed by cancers of the mouth, larynx, and esophagus (53.45%), hypertension and heart problems (52.44%), depend-

Table 1. Demographic characteristics of interviewed workers

Gender	n.	%
Male	1478	100.00
Female	–	–
Age		
<=20	87	5.89
21-30	443	29.97
31-40	423	28.62
41-50	330	22.33
51-60	184	12.45
>=61	11	0.74
Nationality		
Italian	182	12.31
Indian	679	45.94
Filipino	486	32.88
English	5	0.34
East Europe	93	6.29
Chinese	14	0.95
French	19	1.29
Educational level		
Elementary	54	3.65
Middle school	198	13.40
High school	425	28.76
Professional diploma	189	12.79
Occupational training	581	39.31
Degree	31	2.10
Rank		
Captain	70	4.74
Deck officer	251	16.98
Engine room officer	87	5.89
Deck crew	550	37.21
Engine room crew	408	27.60
Galley and catering crew	112	7.58

ence (42.96%), increase in cholesterol and risk of cardiovascular disease (22.19%), nervousness, apathy, anxiety and headache (16.31%). Among the diseases less associated with tobacco smoke by interviewed people, there were mucous hyper-secretion (catarrh) (10.83%) and conjunctivitis (7.24%). The 1.83% of the sample answered 'do not know'.

Concerning health problems declared by interviewed people, 4.53% of responders reported suffering from coughing fits (32.84% of them, productive). Among seafarers asserting to have dyspnea (35 people, representing 2.37% of the sample), 25.71% of them declared dyspnea at rest, and 42.86% of them after an effort. The 6.97% of responders declared to expectorate in the morning. The 88.70% of those who completed the questionnaire stated that cigarette smoking addiction is caused by nicotine, the 23.68% thought that addiction is also due to tar and carbon monoxide, while the 4.74% of the sample did not know at all what ingredient is involved in addiction.

Examining the sample by age, the majority of current smokers belongs to 21-30 years old group (33.88%), while former smokers belong to 31-40 years (31.36%). Among current smokers, the majority of smokers are deck crew members (35.28%), followed by engine room crew (26.40%), and deck officers (19.86%).

Table 2 shows the correlation of smoking with age, educational level, rank, and alcohol use. The prev-alence of smokers was significantly related with the educational level, the working rank and alcohol use. No significant values were noticeable for the age variable. The higher Odds ratio was obtained comparing the alcohol use and smoking.

In terms of number of cigarettes smoked every day, 11.69% of people declared to smoke from 21 to more than 30 cigarettes per day. The majority of interviewed people smokes 1-10 cigarettes (63.79%), followed by those who smoke 11-20 (24.53%). Analysis of the number of cigarettes smoked every day based on the rank shows that captains and officers smoke every day more cigarettes than the crewmembers who smoke 10 cigarettes maximum per day.

Comparing the number of cigarettes smoked per day with the age of subjects working in the captain category or in the crew category, no statistically significant correlation between the number of cigarettes smoked and the age of the subjects was observed. In the crew category, a statistically significant correlation between age and number of cigarettes smoked per day has been found (Pearson value = -1.000; p=0.0001). This correlation is negative, in particular when comparing the age and the number of cigarettes in the range 1-10 cigarettes per day.

The analysis of the results of FTND in the different age groups has shown that the 41-50 and 51-60 age groups have high dependence levels (18.09% and 19.61% respectively). Considering the rank, the cap-

Table 2. Correlation of smoking with the demographic factors

Variables	Number (percent)		P-value	OR	95%CI
	Smoker	Non smoker			
Age					
Less than 30	171	300	0.285	1.14	0.899 to 1.380
More than 30	257	514	0.285	0.88	0.639 to 1.120
Educational level					
Elementary/middle school	74	155	0.0002	1.76*	1.379 to 1.981
Equal to High school	354	1305	0.0002	0.57	0.269 to 0.871
Rank					
captain/officer	135	189	0.0019	1.52*	1.259 to 1.781
crew	293	625	0.0015	0.66	0.399 to 0.920
Alcohol					
No drink	22	91	0.0042	0.47	0 to 0.995
Outside of meals, drunk, often	98	190	0.0042	2.13*	1.604 to 2.656

* Correlation significant of the P (α<0.05)

Table 3. Odds Ratio of single ranks correlating with the medium/high FTND value

Rank	P	OR	95%CI
Galley and catering crew	**0.0225**	0.50	1.430 to 2.549
Engine room crew	**0.0056**	0.43	1.421 to 2.559
Deck crew	**0.0001**	0.31	1.409 to 2.571
Captain	**0.0002**	2.45*	1.523 to 2.457

*Correlation significant of the P (α<0.05)

tains and the deck officers are the groups characterized by high dependence (30.00% and 22.35% respectively).

Comparing the results of FTND in the captains with those obtained in the deck crew, engine room crew, and galley/catering crew, the captains showed a risk of developing a medium/high dependence two times higher than other ranks (Table 3).

Subjects, included in the smoker group, were specifically interviewed also about the awareness of smoking. The 33.41% of seafarers declared to smoke little, the 40.89% enough, the 19.63% a lot, and the 6.1% very much. Cross-checking the dependence and the awareness of it, the highest percentage (44.68%) for the "enough" level of awareness revealed a high/very high dependence. The lowest percentage (6.38%) for the low level related with high, and very high dependence has been recorded.

In terms of job position, the awareness of smoking was statistically analyzed in comparison with the single ranks, processing the data with the Chi square Test. In the galley crew an Odds ratio, relatively to the unconsciousness of smoke dependence, five times higher (Odds ratio = 5.92, p=0.0002) than Odds ratio obtained in the captain rank (OR= 0.17, p=0.0002) was noticeable.

In terms of desire to stop smoking, the 68.09% of seafarers classified in the high/very high dependence level answered that they want to quit smoking. Among this group, the 68.7% has tried to quit, and 95.4% of them restarted to smoke thereafter.

Discussion

This study showed that a low percentage (about one fourth) of seafarers interviewed on board of merchant ships were smokers. This percentage was lower than the general prevalence rate of smoking among seafarers (51, 52). Data processing showed a good perception about the possible effects of tobacco smoking on health. In particular, this awareness concerns cancer (lung, mouth, larynx, and esophagus), cardiovascular diseases (hypertension, heart problems, high cholesterol, etc), nervousness, and anxiety.

The relationship between the prevalence of unhealthy lifestyles, as smoking with some pathologies and ranks on board was further evaluated. This as some studies highlighted a positive correlation between the onset of pathologies linked with an elevated blood cholesterol, high blood pressure, fat in food, smoking, and the different job positions (58, 59), whereas other studies reported only a marginal relationship (60).

In terms of rank, merchant ships should be considered as a working environment to be kept under control because stressful, and characterized by a high prevalence of smokers than general population ashore (51, 61). Even if the prevalence of smokers between the seafarers employed on board of the merchant ships, enrolled in this epidemiological study, is not very high, the smoking habits seem to be circumscribed in specific categories of our sample. The highest percentage of current smokers on board is in the range of age between 21 to 30 years. Other studies have reported a statistically significant correlation between smoking and educational level (52, 62-65), whereas a similar correlation was not found in relation to the different nationality of subjects. In terms of activity on board of merchant ship our data indicate that the seafarers employed as crew were the smokers more at risk. Analyzing the data on the number of cigarettes smoked per day, the captain and officers were the strongest consumers, smoking the maximum number of cigarettes (21 to 30 cigarettes per day).

In contrast, crew members heaviest smokers took 10 cigarettes per day. The worrying result was the high prevalence of hard smokers among captains and officers. These results were confirmed by statistical analysis because people with a role of control and high responsibility showed a positive statistically significant correlation with the smoking habit, with an increasing Odds ratio compared with people with a lower rank.

Furthermore, the crew people were those with the higher number of subjects which never smoked or stopped smoking. These data can be explained considering that captains and officers have more freedom to

choose when and how much to smoke. Another worrying result is the positive and statistically significant correlation between smoking and alcohol use. Probably, the contemporary presence of the smoking and alcohol habits indicates that the subjects which have the necessity to smoke perceive also the necessity to drink alcohol to tolerate the stress or fatigue. These findings are consistent with those of other studies suggesting a possible correlation between the increase of smoking and alcohol use, and the work-related stress. Alcohol and cigarettes could also be used as anti-anxiety or antidepressant agents to relieve the impact of job stress, and to self-medicate physiological effects induced by stress (elevated cortisol, suppressed serotonin, and catecholamine secretion) to achieve the internal homeostasis (65, 66).

In terms of age analysis, younger crews represented the main smokers. In fact, a positive statistically significant correlation was found between the younger age groups (<30 years) and smoking. These findings could be explained because even if the number of cigarettes smoked by younger crews is not elevated, the frequency of smoking in this category is higher than frequency registered in the other crews (>30 years). The observation that younger people are the main smokers is worrying as they are at risk of dependence because of their low awareness of how much they smoke.

A less straightforward question is whether seafarers are also at heightened risk of dependence if employed in the higher ranks. Besides to the raw analysis on the number and the frequency of cigarettes smoked for single ranks and single range of age, the level of dependence has been analyzed.

The FTND showed that all people interviewed has been assessed on a low or very low dependence level.

As regards as the awareness, the galley crew has been associated with six times less awareness than captains on the amount of smoking. Compared to the engine room crews, a statistically significant correlation between this category and the captains, was not found.

Although this study has some limitations, such as the choice of sample (convenience and non-randomized) that could represent a possible bias, our results are in agreement with data of literature, in particular concerning the correlation between smoking and

alcohol use, strengthening the relationship between the high levels of nicotine and alcohol consumption in seagoing workers (30, 51, 67). Probably, the free availability of cigarettes on board, could be another element contributing to continue or to start smoking between seafarers (25, 68, 69). Sailors work away from home for a long time and they do not benefit from many anti-smoking policies or rules that are the most smoking cessation interventions for the general population (63).

Traditionally, the seafaring has been perceived by the public as a risky activity, mainly because of the shipping accidents and recently the piracy. Only in recent studies, the work on board of ships has been associated to a high risk for chronic, lifestyle-related diseases, such as cancer and coronary heart disease, due to a high exposure to chemicals as well as sunlight, but also to lifestyle behaviours, such as smoking, alcohol consumption and diet (25, 30, 51, 70). Therefore, the results of this study suggest to further investigate the presence of other risk factors such as diet, physical exercise, combined with tobacco smoking, and obesity (71).

All these considerations highlight the strong need to activate prevention campaigns directed towards this particular working category. A first approach is represented by the 'Healthy ship' project (Health Protection and Safety on Board Ships), an initiative of CIRM (Centro Internazionale Radio Medico, the Italian Telemedical Maritime Assistance Service) and the University of Camerino, focused on the prevention of diseases on board ships through information campaigns about the major health risks for seafarers and their prevention (13, 14, 72, 73)

References

1. Siracusa M, Grappasonni I, Petrelli F. The pharmaceutical care and the rejected constitutional reform: what might have been and what is. Acta Biomed. 2017 Oct 23;88(3):352-359.
2. Signorelli C, Odone A, Gozzini A, et al. The missed Constitutional Reform and its possible impact on the sustainability of the Italian National Health Service. Acta Biomed. 2017 Apr 28;88(1):91-94.

3. Petrelli F, Contratti CM, Tanzi E, Grappasonni I. Vaccine hesitancy, a public health problem. Ann Ig. 2018 Mar-Apr;30(2):86-103.

4. Martìnez-Sànchez JM, Fernàndez E, Fu M, et al. Smoking Behaviour, Involuntary Smoking, Attitudes towards Smoke-Free Legislations, and Tobacco Control Activities in the European Union. PLoS ONE 2010; 5(11): e13881.

5. Osservatorio Fumo Alcol e Droga – OSSFAD - Istituto Superiore di Sanità (2012). Rapporto sul fumo in Italia 2012. Roma, Italia

6. Bernstein SL, Boudreaux ED, Cabral L, et al. Nicotine dependence, motivation to quit, and diagnosis among adult emergency department patients who smoke: a national survey. Nicotine & Tobacco Research. 2008; 10 (8): 1277-82.

7. Fagerström K. The epidemiology of smoking: health consequences and benefits of cessation. Drugs 2002; 62 (Suppl 2): 1-9

8. Tizabi Y, Overstreet D H, Rezvani AH, et al. Antidepressant effects of nicotine in an animal model of depression. Psychopharmacology 1999; 142(2), 193-99

9. Invernizzi G, Nardini S, Bettoncelli G, et al. The role of general practitioner in tobacco control: reccomendations for a proper management of the smoking patient. Rassegna di Patologia dell'Apparato Respiratorio 2002; 17: 55-70

10. Jarvis MJ. ABC of smoking cessation: Why people smoke. BMJ: British Medical Journal 2004; Jan 31; 328(7434): 277-79

11. Frantzeskou E, Kastania AN, Riza E, Jensen OC, Linos A. Risk factors for fishermen's health and safety in Greece. Int Marit Health 2012; 63(3): 155-61

12. Jeżewska M, Iversen R. Stress and fatigue at sea versus quality of life. Int Marit Health 2012; 63(3): 106-15

13. Grappasonni I, Petrelli F, Scuri S, Mahdi SS, Sibilio F, Amenta F. Knowledge and Attitudes on Food Hygiene among Food Services Staff on Board Ships. Ann Ig. 2018 Mar-Apr;30(2):162-172.

14. Grappasonni I, Marconi D, Mazzucchi F, Petrelli F, Scuri S, Amenta F. Survey on food hygiene knowledge on board ships. Int Marit Health. 2013;64(3):160-7.

15. Siracusa M, Petrelli F. Trade of food supplement: food or drug supplement? Recenti Prog Med. 2016 Sep;107(9):465-471.

16. Grappasonni I, Scuri S, Tanzi E, Kracmarova L, Petrelli F. The economic crisis and lifestyle changes: a survey on frequency of use of medications and of preventive and specialistic medical care, in the Marche Region (Italy). Acta Biomed. 2018 Mar 27;89(1):87-92.

17. Szymańska K, Jaremin B, Rosik E. Suicides among Polish seamen and fishermen during work at sea. Int Marit Health 2006; 57: 36-45

18. Scuri S, Tesauro M, Petrelli F, Peroni A, Kracmarova L, Grappasonni I. Implications of modified food choices and food-related lifestyles following the economic crisis in the Marche Region of Italy. Ann Ig. 2018 Mar-Apr;30(2):173-179.

19. Petrelli F, Grappasonni I, Peroni A, Kracmarova L, Scuri S. Survey about the potential effects of economic downturn on alcohol consumption, smoking and quality of life in a sample of Central Italy population. Acta Biomed. 2018 Mar 27;89(1):93-98.

20. Leone A. Smoking and hypertension: independent or additive effects to determining vascular damage? Curr Vasc Pharmacol 2011; 9(5): 585-93

21. Pittilo RM. Cigarette smoking, endothelial injury and cardiovascular disease. Int J Exp Pathol 2000; 81(4): 219-30

22. Bollettino sulle dipendenze (http://www.bollettinodipendenze.it/FLASH-NEWS/Rapporto-OMS-sul-fumo-di-tabacco.html) (consultato il 22 gennaio 2014)

23. Ministero Della Salute; http://www.salute.gov.it

24. Grappasonni I, Petrelli F, Amenta F. Deaths on board ships assisted by the Centro Internazionale Radio Medico in the last 25 years. Travel Med Infect Dis. 2012 Jul;10(4):186-91.

25. Fort E, Massardier-Pilonchery A, Bergeret A. Alcohol and nicotine dependence in French seafarers. International Maritime Health 2009; 60(1-2): 18-28

26. Fort E, Massardier-Pilonchéry A, Bergeret A. Psychoactive substances consumption in French fishermen and merchant seamen. International Archives of Occupational and Environmental Health 2010; 83(5): 497-509

27. Spacilova L, Klusonova H, Petrelli F, Signorelli C, Visnovsky P, Grappasonni I. Substance use and knowledge among Italian high school students. Biomed Pap Med Fac Univ Palacky Olomouc Czech Repub. 2009 Jun;153(2):163-8

28. Kračmarová L, Klusoňová H, Petrelli F, Grappasonni I. Tobacco, alcohol and illegal substances: experiences and attitudes among Italian university students. Rev Assoc Med Bras (1992). 2011 Sep-Oct;57 (5):523-8.

29. Petrelli F, Scuri S, Tanzi E, Nguyễn TTC, Grappasonni I. Lifestyles and discomfort in a sample of young Romanian students. J Prev Med Hyg. 2018 Sep 28;59(3):E230-E235.

30. Oldenburg M, Harth V, Manuwald U. Non-cancer diseases requiring admission to hospital among German seafarers. International Maritime Health. 2015; 66(1): 6-10

31. Scuri S, Petrelli F, Tesauro M, Carrozzo F, Kracmarova L, Grappasonni I. Energy drink consumption: a survey in high school students and associated psychological effects. J Prev Med Hyg. 2018 Mar 30;59(1):E75-E79.

32. Petrelli F, Grappasonni I, Evangelista D, et al. Mental and physical effects of energy drinks consumption in an Italian young people group: a pilot study. J Prev Med Hyg. 2018 Mar 30;59(1):E80-E87.

33. Grappasonni I, Petrelli F, Traini E, Grifantini G, Mari M, Signorelli C. Psychological symptoms and quality of life among the population of L'Aquila's "new towns" after the 2009 earthquake. Epidem Biostat Pub Health. 2017; 14(2): e11690-1-13.

34. Priebe S, Grappasonni I, Mari M, Dewey M, Petrelli F, Costa A. Posttraumatic stress disorder six months after an earthquake: findings from a community sample in a rural region in Italy. Soc Psychiatry Psychiatr Epidemiol. 2009 May;44(5):393-7.

35. Grappasonni I, Petrelli F, Klusoňová H, Kračmarová L.

Level of understanding of medical terms among italian students. Ceska Slov Farm. Winter 2016;65(6):216-220

36. Cioffi P, Laudadio L, Nuzzo A, Belfiglio M, Petrelli F, Grappasonni I. Gemcitabine-induced posterior reversible encephalopathy syndrome: a case report. J Oncol Pharm Pract. 2012 Jun;18(2):299-302.

37. Mignini F, Sabbatini M, Pascucci C, Petrelli F, Grappasonni I, Vanacore N. Pharmaco-epidemiological description of the population of the Marche Region (central Italy) treated with the antipsychotic drug olanzapine. Ann Ist Super Sanita. 2013;49(1):42-9.

38. Cioffi P, Marotta V, Fanizza C, Giglioni A, Natoli C, Petrelli F, Grappasonni I. Effectiveness and response predictive factors of erlotinib in a non-small cell lung cancer unselected European population previously treated: a retrospective, observational, multicentric study. J Oncol Pharm Pract. 2013 Sep;19(3):246-53.

39. Cioffi P, Antonelli D, Belfiglio M, Melena S, Petrelli F, Grappasonni I. The impact of a pharmacist as a member of healthcare team on facilitating evidenced-based prescribing of innovative drugs in an Italian oncology department. J Oncol Pharm Pract. 2012 Jun;18(2):207-12.

40. Siracusa M, Grappasonni I, Petrelli F. The criminal liability of the hospital pharmacist vs the liability of the hospital. Recenti Prog Med. 2016 Jan;107(1):19-24.

41. Oldenburg M, Jensen HJ, Latza U, Baur X. The risk of coronary heart disease of seafarers on vessels sailing under German flag. Int Marit Health. 2010; 61, 3: 123-28

42. Oldenburg, M. Risk of cardiovascular diseases in seafarers. International Maritime Health 2014; 65(2): 53-57

43. Carotenuto A, Molino I, Fasanaro A M, Amenta F. Psychological stress in seafarers: a review. International Maritime Health 2012; 63(4): 188-94

44. Jepsen JR, Zhao Z, Van Leeuwen WM. Seafarer fatigue: a review of risk factors, consequences for seafarers' health and safety and options for mitigation. International Maritime Health 2015; 66(2): 106-17

45. Jeżewska M, Iversen R, Grubman M. (2012). Stress and fatigue at sea versus quality of life II International Congress on Maritime, Tropical, and Hyperbaric Medicine Venue: on board "Scandinavia" ferry, Gdansk - Nynashamn - Gdansk With supporting funding from the ITF Seafarers' Trust REPORT 2012; 106-15

46. Cronan TA, Conway TL, Kaszas SL. Starting to smoke in the Navy: when, where and why. Social Science & Medicine 1991; 33(12): 1349-53

47. Lawrie T, Matheson C, Ritchie L, Murphy E, Bond C. The health and lifestyle of Scottish fishermen: a need for health promotion. Health Education Research 2004; 19(4): 373-79

48. Marco JL, Zubillaga GG. Smoking among maritime workers in the province of Guipúzcoa. An epidemiological study. Archivos de bronconeumologia 1995; 31(9): 443-47

49. Nogueroles A, Juan AS, Almenara BJ, Failde MI, Zafra MJ. (1992). The tobacco habit among fishermen of the Barbate coast (Cádiz). Revista de sanidad e higiene pública 1992; 66(5-6), 299-305

50. Novalbos J, Nogueroles P, Soriguer M, Piniella F. Occupational health in the Andalusian fisheries sector. Occupational medicine 2008; 58(2): 141-43

51. Hjarnoe L, Leppin A. Health promotion in the Danish maritime setting: challenges and possibilities for changing lifestyle behavior and health among seafarers. BMC public health 2013; 13(1): 1165.

52. Hjarnoe L, Leppin A. A risky occupation? (Un)healthy lifestyle behaviors among Danish seafarers. Health Promot Int 2014; 29(4): 720-9.

53. Grappasonni I, Paci P, Mazzucchi F, De Longis S, Amenta F. Awareness of health risks at the workplace and of risks of contracting communicable diseases including those related to food hygiene, among seafarers. Int Marit Health 2012; 63 (1):24-31

54. Heatherton TF, Kozlowski LT, Frecker RC, Fagerstrom KO. (1991). The Fagerström Test for Nicotine Dependence: a revision of the Fagerström Tolerance Questionnaire. British Journal of Addiction 1991; 86(9), 1119-27

55. Du Plooy JL, Macharia M, Verster C. Cigarette smoking, nicotine dependence, and motivation ot quit smoking in South African male psychiatric inpatients. BMC Psychiatry 2016; 16; 16(1):403.

56. Smith F. Survey research: (2) Survey instruments, reliability and validity. Int J of Pharm Practice 1997; 5: 216-26

57. XLSTAT. Statistical software & data analysisi add-on for Excel. Addinsoft (2017)

58. Lemke MK, Apostolopoulos Y, Hege A, Wideman L, Sönmez S. Work, sleep, and cholesterol levels of U.S. long-haul truck drivers. Industrial Health 2017; 55: 149-61

59. Caruso CC, Hitchcock EM, Dick RB, Russo JM, Schmit JM. Overtime and extended work shifts: recent findings on illnesses, injuries, and health behaviors. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, Cincinnati, OH. www.cdc.gov/niosh

60. Potvin L, Richard L, Alison CE. Knowledge of cardiovascular disease risk factors among the Canadian population: relationships with indicators of socioeconomic status. Canadian medical association journal. Supplement To CMAJ 2000;162(9 Suppl)

61. Hansen HL, Tüchsen F, Hannerz H. Hospitalisations among seafarers on merchant ships Occup Environ Med 2005; 62:145-50

62. Siahpush M, McNeill A, Hammond D, Fong GT. Socio-economic and country variations in knowledge of health risks of tobacco smoking and toxic constituents of smoke: results from the 2002 International Tobacco Control (ITC) Four Country Survey. Tobacco Control 2006; 15 (Suppl III): 65-70.

63. Rachiotis G, Karydis I, Drivas S, Hadjichristodoulou C. Pattern of Smoking Habit among Greek Blue and White Collar Workers. Int. J. Environ. Res. Public Health 2009; 6: 1812-17

64. Memon A, Moody PM, Sugathan TN, et al. Epidemiology of smoking among Kuwaiti adults: prevalence, characteris-

tics, and attitudes. Bull World Health Organ 2000; 78(11): 1306-15

65. Sunday A, Mesbah FS. The effect of job stress on smoking and alcohol consumption. Health Economics Review 2011, 1:15.

66. Hassani S, Yazdanparast T, Seyedmehdi SM, Ghaffari M, Mirsaeed Attarchi M, Bahadori B. Relationship of Occupational and Non-Occupational Stress with Smoking in Automotive Industry Workers. Tanaffos. 2014; 13(2): 35-42

67. John U, Meyer C, Rumpf HJ, Hapke U. Probabilities of alcohol high-risk drinking, abuse or dependence estimated on grounds of tobacco smoking and nicotine dependence. Addiction 2003; 98: 805-14

68. Little HJ. Behavioral mechanism underlying the link between smoking and drinking. Alcohol Res Health 2000; 24: 215-24

69. Offen N, Arvey SR, Smith EA, Malone RE. Forcing the Navy to sell cigarettes on ships: how the tobacco industry and politicians torpedoed Navy tobacco control. American journal of public health 2011; Mar; 101 (3): 404-11

70. Geving IH, Jørgensen KU, Thi MS, Sandsund M. Physical activity levels among offshore fleet seafarers. Int Marit Health 2007; 58(1-4): 103-14

71. Filikowski J, Rzepiak M, Renke W, Winnicka A, Smolinska D. Selected risk factors of ischemic heart disease in Polish seafarers. Preliminary report. Int Marit Health 2003; 54 (1-4): 40-6.

72. Grappasonni I, Cocchioni M, Degli Angioli R, et al. Recommendations for assessing water quality and safety on board merchant ships. Int Marit Health. 2013;64(3):154-9.

73. Scuri S, Petrelli F, Grappasonni I, et al. Food safety on board tankers. Results of analysis from 'Healthy Ship' project. Int Marit Health. 2019;70(1):68-75.

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