

## Strategies for Prevention of Non-communicable Diseases in Seafarers and Fishermen: Lessons Learned

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Noncommunicable diseases (NCDs) are responsible for almost two-thirds of all deaths globally. Of the 57 million global deaths in 2008, 36 million, or 63%, were due to NCDs, principally cardiovascular diseases, diabetes, cancers and chronic respiratory diseases. Mental health is now also seen as part of the chronic noncommunicable diseases [1]. These diseases share more or less the same risk factors (tobacco use, unhealthy diet, physical inactivity and the harmful use of alcohol and harmful mental health risks factors). As the impact of NCDs increases and as population ages, annual NCD deaths is projected to continue to rise worldwide [2]. In our research institute, we focus on seafarers and fishermen but the examples could easily be applied for other industries as well. Our aim is to inspire other health professionals to do systematic review studies of relevance for their specific target populations and to plan proved effective strategies.

Seafaring employees face more difficult working and living conditions than their peers on land. Their health is affected by the environment in which they live, often coupled with long working hours that contribute to eating more carbohydrate food and less physical activity in a working environment with high demands.

Study examples: In a seafaring population 45-66 years of age 77% was overweight with a BMI > 25 while only 60% in the same age group was overweight in 2010 [3]. Among the 50-59 years old seafarers 67% had hypertension and 30% had pre-hypertension. BP  $\geq$  140/90 mm Hg was recorded as hypertension and between 120-140/80-90 as prehypertension [4]. For comparison, 33% in the age group 55-64 of Danish workers had abnormal high HBP (Home Blood Pressure) and 25 % had either white coat hypertension (WCH) or masked hypertension (MH) [5].

### Do Primary Prevention Programs Work?

A review of the literature of the effectiveness of worksite nutrition and physical activity programs comprised 48 studies in all. Most of the studies combined informational and behavioural strategies to influence diet and physical activity; fewer studies modified the work environment (e.g., cafeteria, exercise facilities) to promote healthy choices. This review found that worksite nutrition and physical activity programs achieve modest improvements in employees' weight status at the 6-12 months follow-up [7]. A Cochrane review based on 57 studies with multiple primary risk factor interventions had little or no impact on the risk of coronary heart disease mortality or morbidity. The effects of attempting behaviour change in the general population do not appear to be effective [8]. Swinburne et al. concluded in the Lancet that increases in obesity in almost all countries seem to be driven mainly by changes in the global food system. Unlike other major causes of preventable death and disability, such as tobacco use, there are no examples of population trials in which the obesity epidemic has been reversed by public health measures [9].

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Statins are the most widely prescribed, cholesterol-lowering drugs in the world. However, according to many studies there is only limited evidence showed that primary prevention with statins may be cost effective and improve patient quality of life. Caution should be taken in prescribing statins for primary prevention among people at low cardiovascular risk [10].

A structural health promotion intervention was implemented in two Danish shipping companies. (healthy cooking courses for ship cooks and improvement of fitness facilities) as well as health education interventions (smoking cessation courses, individual exercise guidance and extra health check-ups) at the maritime workplace. Significant changes were identified for levels of fitness, daily sugar intake and metabolic syndrome. The findings suggest that a multicomponent health promotion intervention program has the potential to achieve change in seafarers' health behaviour and health parameters [11].

### Do Routine Health Check-ups Work in Primary Prevention?

Study examples: A Cochrane review with 11940 deaths did not find an effect of general health checks on total mortality or on mortality due to cardiovascular diseases [12].

Another community based, individually tailored intervention programme with screening for risk of ischaemic heart disease and repeated lifestyle intervention over five years had no effect on ischaemic heart disease, stroke, or mortality at the population level after 10 years [13].

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Krogsbøll et al. identified 16 randomised trials which had compared a group of adults offered general health checks to a group not offered health checks. Results were available from 14 trials, including 182,880 participants. Nine trials studied the risk of death and included 155,899 participants and 11,940 deaths. There was no effect on the risk of death nor on the risk of death due to cardiovascular diseases or cancer [12].

A sample of 524 Danish seafarers who underwent medical fit-for-duty examination by seamen's doctors were tracked and re-examined after 2 years. At baseline, all participants received general advice regarding lifestyle issues. Twenty-four percent of the seafarers were found with Metabolic Syndrome and they were additionally given specific advice regarding treatment. After the two years of follow-up, smoking and alcohol consumption was not reduced. In spite of the intervention, the prevalence of Metabolic Syndrome increased in this group of seafarers. This study indicates the limitations of individual health promotion and the need for corporate actions [14].

### Do Secondary Prevention Programs Help?

Secondary prevention is defined as health risk prevention among persons with clinically apparent diseases. Study examples: Forty-four studies were included in a systematic review of studies with patients from the US Diabetes Prevention Program (DPP) lifestyle modification program. The authors concluded that the Diabetes Prevention Program study showed weight loss in high-risk adults lowered diabetes incidence and cardiovascular disease risk [15]. In another review study with data from 74 trials it was concluded that intensive diet and physical activity behavioural counselling in persons with risk factors for cardiovascular disease resulted in consistent improvements across various important intermediate health outcomes up to 2 years [16].

### Conclusions

Based on this limited literature review and the few examples, primary prevention studies with personal diet and physical activity behavioural counselling do not seem to work. Routine health check-ups and advice in primary prevention do not seem to help either. Secondary prevention with intensive diet and physical activity behavioural counselling in persons with high risk factors for diabetes and cardiovascular disease seems to be effective.

### Recommendations

Comprehensive structural preventive programs with the needed legislations and regulations are recommended by the WHO and other International Health Institutions [17,18]. Such programs should include a combination of fiscal policies, legislation, changes to the environments. Raising awareness of health risks by promoting healthier diets physical activity that include healthy mental health environments. The tasks for the universities and health professionals are monitoring and research, building up current knowledge about the health risks in work and leisure time to be used for the training. Clinicians, patient organisations, workers organisations and research institutions work together to provide the necessary knowledge and training programs. The aim is to establish comprehensive programs for changes for healthy occupational environments, healthy diet and physical activities in healthy mental cultures. Leaders and all teams in the industries must be trained and inspired by the public health professionals to establish a public health culture that shows the way forward with the use of best practices and strategies.

### Competing Interests

The authors declare that no competing interests is present.

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