

Fishery Health in the Face of Environmental Change

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Abstract

It is crucial to achieve sustainable development goals for the health of fishery workers in the face of climate change because of specific working environments. Fishery workers face a risky work environment that frequently results in specific injuries and fatalities. However, only a few studies have compared the health status of fishery workers with that of farmers and employed workers of similar socioeconomic status through long-term longitudinal follow-up. **Methods:** This retrospective cohort study made use of a subset of the Taiwan National Health Insurance Research Database called the Longitudinal Health Insurance Database 2000. Included were only employed workers, farmers, and fishery workers. Participants newly diagnosed with 18 diseases—cardiometabolic diseases, mental illness, chronic kidney disease, infection, and malignancy—were included based on the majority of causes of death and related diseases. Participants who had been diagnosed with these diseases in the past were left out. From the first day of the study, July 1, 2000, to the date of diagnosis and withdrawal, or December 31, 2012, whichever came first, all included participants were followed up. We used the Cox model to investigate the health status of the participants in a cohort study that was propensity score-matched due to the significant difference in the baseline demographics. **Results:** In the wake of coordinating, there were unimportant contrasts in the pattern socioeconomics of fishery laborers, ranchers, and utilized specialists. Fishermen were more likely than farmers and employed workers to be diagnosed with 11 and 14 diseases, including hypertension (hazard ratio [HR]: Diabetes (HR: 1.11, $p < 0.01$), Dyslipidemia (HR: 1.21, $p < 0.001$), and Depression (HR: 1.18, $p < 0.001$), Peptic ulcer (HR: 1.38, $p < 0.001$), 1.17, $p < 0.001$), and chronic hepatitis caused by viruses (HR: Hepatocellular carcinoma (HR: 2.06, $p < 0.001$), 1.67, $p < 0.001$), as well as total cancer (HR: 1.26, $p < 0.001$). **Conclusions:** Fishery workers were more susceptible to cardiometabolic diseases, mental illness, infection, and malignancy than farmers and employed workers. As a result, in order to reduce health inequality, it is absolutely necessary to place a particular emphasis on health policies for fishermen, such as the provision of antiviral treatments that can cure the virus and the implementation of health promotion programs tailored to the culture.

Keywords: Fishery workers; Propensity score-matched; Cox proportional hazard model; Cardiometabolic diseases; Chronic viral hepatitis

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Introduction

The fishery industry, also known as aquaculture farming, which includes both inland and marine farming, employs 130,000

households in Taiwan, employing approximately 340,000 people. An official report says that the average annual fisheries production is more than 1.27 million tons, worth about 32 million dollars. Since Taiwan is arranged in a subtropical locale,

its marine fisheries are advanced. More than 100 aquatic species are cultivated using cutting-edge aquaculture techniques; As a result, Taiwan has earned the moniker "aquaculture kingdom." However, personal health issues, aging, and the decrease in fish production caused by climate change have led to an increase in the number of fishery workers leaving the industry. In accordance with the United Nations' sustainable development goals, it is crucial to constantly ensure that fishery workers have enough food, are safe, and are healthy [1].

Previous cross-sectional studies from Asia, Australia, Brazil, Europe, and the United States indicate that extreme temperature events and performing hazardous tasks frequently result in fishery workers developing physical and mental illnesses, such as cardiometabolic diseases, musculoskeletal injuries, heat stress, respiratory symptoms, infection, and depression. The majority of previous studies on fishery workers' health have utilized cross-sectional and short-term study designs; Long-term and longitudinal cohort studies, on the other hand, have only been used in a few studies. Additionally, numerous nations have neglected the health and well-being of millions of fishery workers [2].

Diabetes, hypertension, coronary heart disease, and cancer—also known as cardiometabolic diseases—have long been the leading causes of death among Taiwanese people. As a result, the purpose of this retrospective and longitudinal cohort study was to investigate the health status of fishermen based on the most common causes of death and to ascertain whether fishermen tended to have a greater risk of developing certain diseases than farmers and employed workers of similar socioeconomic status [3].

Materials and Methods

Source of data

This retrospective cohort study made use of a subset of the Taiwan National Health Insurance Research Database (NHIRD) called the Longitudinal Health Insurance Database 2000 (LHID2000). The LHID2000 collects claims information from more than 23 million individuals, or more than 99.8% of Taiwanese residents. The LHID2000 contains claims information from a random million people who were alive on July 1, 2000, between 1997 and 2012. The Taiwan National Health Research Institutes validated the LHID2000 representation of the general Taiwanese population. For clinical diagnosis, ICD-9-CM (International Classification of Diseases, Ninth Revision) codes were utilized. The NHIRD has been described in greater detail previously. The study has been approved by the Institutional Review Board, despite using secondary and de-identified data [4].

Data analysis

A cohort study with propensity score matching was carried out in order to distinguish the outcomes between the groups because of some differences in the baseline demographics of the groups (fishery workers, farmers, and employed workers). Using multivariable logistic regression analysis, the propensity scores (fishery workers, for example) was the predicted probability of belonging to one group with certain independent variable values. Age, gender, urbanization level, region of residence, and monthly income were used to calculate the propensity score. With a

stochastic accordance order and no substitute, the matching was handled with acquisitive closest-neighbour arithmetic and a caliper of 0.2 times the standard bias of the logit of the propensity score. The absolute value of the standardized difference (STD) was used to evaluate the balance between the groups [5].

Discussion

The prevalence of newly diagnosed comorbidities among employed fishermen, farmers, and workers. This study revealed three significant results after utilizing the Cox proportional hazards model and the propensity score-matched cohort. First, farmers were more likely than fishery workers to contract 11 new diseases. Second, fishery laborers had essentially more serious dangers for 14 recently analyzed sicknesses than utilized specialists. Thirdly, fishery workers must be aware of mental health conditions like anxiety, depression, and peptic ulcers [6].

Fishery workers had a significantly higher incidence rate of hepatocellular carcinoma. In any case, in a few past examinations in Brazil and Nordic nations, skin and lip disease were more normal in sailors and anglers than in everyone. The fact that previous studies included both maritime populations while our study primarily included workers in small-scale aquaculture farming may account for the disparity in the working environment and circumstances. Additionally, fishery workers outperformed employed workers and farmers in terms of the importance of hepatitis B and C virus infection identification and HR in our study. Hepatitis B and C viruses are the most common cause of liver fibrosis and hepatocellular carcinoma worldwide, according to current evidence. This explains why, in our study, fishery workers were significantly more likely than farmers and employed workers to develop cancer and hepatocellular carcinoma [7].

Despite the fact that the working environment was not the focus of our study, other cross-sectional studies have shown that fishery workers lead unhealthy lifestyles, such as smoking, drinking alcohol, and not getting enough fruits and vegetables in their diets. The majority of cardiometabolic diseases can be avoided by reducing risky behaviors like smoking, eating poorly, living a sedentary lifestyle, and drinking alcohol. Therefore, further research should identify cardiometabolic risk factors and diseases in fishery workers as soon as possible to initiate counseling and medication management, as well as to prevent psychological distress through workplace health promotion. In addition, a thorough qualitative research design is required to comprehend the lifestyle pattern of fishery workers, such as their 24-hour daily routine and weekly diet [8].

First, there was no disease severity information in the national database; data from the laboratory; index of body mass; or individual behaviors like smoking, drinking, eating a well-balanced diet, and getting active. Second, despite the fact that Taiwan's National Health Insurance was first implemented in 1995, there may have been insufficient medical resources or a poor healthcare delivery system in rural areas. As a result, the study's prevalence rate of disease diagnosis may be underestimated. Thirdly, there is a gap in time between the current research (2000–2012) and the year 2022. The status of monthly income and the degree of urbanization vary from decade to decade in some demographic

data. It is encouraged for future studies to make use of more recent data [9].

Regarding a comprehensive understanding of the health status of fishery workers, the study has some strengths. First, we used a national database to look at a large number of patients over a more than 13-year period. Second, the effects of data collection, region, and institution-related deviation were minimized because the NHIRD provided disease information from Taiwanese individuals in general. Thirdly, the NHIRD made it possible for us to collect large, geographically dispersed samples of patients with a variety of sociodemographic characteristics, eliminating the need to reduce the number of patients in the cohort who strayed from continuous progress. The national population-based and retrospective longitudinal cohort study design is the fourth important strength [10].

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Conclusions

In conclusion, our findings demonstrate that, in comparison to employed workers and farmers, fishery workers were more affected by cardiometabolic diseases, infectious diseases, mental distress, and cancer, particularly liver cancer. Unfair, preventable, or reversible health disparities can be addressed with the help of the current findings. Although the Taiwanese government introduced the National Health Insurance, which covered 99 percent of the population and was met with great satisfaction, the majority of fishermen live near the coast, which limits their access to medical facilities and clinics. Through public health actions, health equity strategies and social inequality must be investigated in subsequent studies. In addition, these findings emphasize the necessity of establishing culture-specific health promotion programs and expanding primary healthcare services nationwide.