A Protocol to Investigate the Adoption and Safety Profile of an Underwater Acoustic Diver Emergency Signalling Device in the Lobster Diving Community of False Bay, South Africa

L, i, n, d, i, w, e, v, a, n, d, e, r, M, e, r, w, e, ,, A, n, i, k, a, B, o, t, h, a, ,, K, a, g, i, s, o, N, k, o, s, i

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Abstract

Commercial lobster diving in False Bay is a high-risk activity with a history of incidents. Existing surface-based emergency signals are frequently inadequate in poor conditions. Underwater acoustic signalling technology presents a potential alternative, but its adoption and effect on safety within this community are not documented. This protocol describes a study to assess the adoption rate and safety profile of an underwater acoustic diver emergency signalling (UADES) device among False Bay's professional lobster divers. The primary objectives are to measure the device's adoption following a targeted intervention and to compare patterns of reported safety incidents before and after its introduction. A mixed-methods, prospective cohort study will be conducted. All active lobster divers in the region will be invited. After a baseline survey on current safety practices, participants will receive a UADES unit and training. Quantitative data on device usage and diving incidents will be collected via monthly logbooks and follow-up surveys over one diving season. Qualitative data on user experience will be obtained through concluding focus group discussions. This is a study protocol; no empirical findings exist. The primary anticipated outcome is a quantified device adoption rate. Secondary outcomes will include analysed trends in near-misses and emergency reports, and thematic insights into the divers' perceptions of the device's utility and integration into their safety routines. The study is

designed to produce new evidence on the practical uptake and perceived safety value of an acoustic signalling device in a high-risk African diving setting. This evidence will inform future safety equipment strategies for comparable artisanal diving communities. Based on the results, recommendations will be developed for diving safety regulators, equipment manufacturers, and training agencies concerning the implementation and promotion of such devices. diving safety, hyperbaric medicine, underwater acoustics, emergency signalling, occupational health, South Africa This protocol outlines the first structured investigation into the adoption and safety impact of an underwater acoustic emergency device within a high-risk African commercial diving community, aiming to fill a significant evidence gap in regional diving medicine.