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and the Way Forward**

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The development of a mobile application to enhance fetal dose monitoring among pregnant radiographers

Ionizing radiation has the potential to cause harmful effects to cells. The risk of these effects increases in a fetus, whose tissues are still developing. The effects of radiation, which is dependant on the amount of exposure received, can present as deterministic effects, which can be immediately seen or stochastic effects which present later in life or in the offspring of the fetus exposed. Based on this theory, occupational health and safety is heightened for the pregnant radiographer who is required to wear a special dosimeter to record and monitor the fetal dose exposure. This process is self-regulated and done by the pregnant radiographer herself. In the clinical department it was observed that pregnant radiographers don't use their dosimeters correctly and do not have a consistent method of recording and monitoring their fetuses doses. The aim of the study is to develop a fetal dose monitoring mobile application to enhance the manner in which pregnant radiographers record and monitor fetal doses. The research will follow a Design Science Research (DSR) paradigm and Behaviour change, User-centered and Social marketing (BUS) framework, which will guide the objectives. The study will follow a mixed methods research design, incorporating four major phases, each aligned with the DSR paradigm, namely 1) Problem awareness, 2) Suggestion, 3) Development, 4) Evaluation and 5) conclusion. In problem awareness, literature and the proposal will serve as a strategy to highlight the problem as it exists. In the suggestion phase, a quantitative approach will be followed with the use of a national survey which will inform the features that need to be included in the mobile application. In the development phase of the mobile application, two cycles of development will take place following the BUS framework. In the evaluation phase, the usability of the developed prototype will be evaluated through eye tracking in a laboratory setting. The usefulness of the mobile application will be evaluated qualitatively through telephonic in-depth interviews with participants who used the mobile application in their natural setting. The study envisions to contribute to the body of literature by describing the rigorous process of development and evaluation. In addition to this, it aims to provide a solution to the challenge identified, and thus is inline with the pragmatic nature of DSR. The development of the mobile application envisions to use technology innovatively to provide a solution to inconsistent fetal dose monitoring among pregnant radiographers in South Africa. This will therefore contribute towards enhancing radiation protection methods for the pregnant radiographer and thus improve occupational health and safety for both mother and the unborn child, which aligns to the World Health Organisation (WHO) Sustainable Development Goals (SDG) three; good health and wellbeing. The study also aligns with the 17th SDG, namely industry partnership, whereby it will foster a collaboration with the Faculty of Engineering, Business and information technology (EBIT) and the faculty of Health Sciences

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