Medical imaging to visualise health concerns in order to change receivers' health behaviours and risk factors.

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Introduction

Given that no communicable diseases account for an estimated 71% of all fatalities worldwide each year, achieving and maintaining improvements in health-related behaviours and associated risk factors is a critical challenge for population health. Smoking, alcohol consumption, and the consumption of nutritionally deficient diets are among the most significant global risk factors for total disease burden, as are linked risk factors such as high systolic blood pressure, body mass index (BMI), fasting glucose, and low-density lipoprotein (LDL) cholesterol [1].

Risk information is widely disseminated in healthcare settings, in part because it is hoped that it may drive receivers to adjust their health-related behaviours in order to reduce their risks. As a result, there is continuous clinical and academic interest in establishing the type of risk information and distribution methods that can most successfully encourage such changes, particularly if they can take advantage of easily available practises and technologies. Providing personal risk information, such as genetic or phenotypic disease risks, such as cardiovascular disease and cancer, appears to have only minor effects on receivers' usual health-related behaviours. Medical imaging data that directly demonstrate actual harm or diminished body function—for example, structural or functional bodily damage attributable to a specific behaviour, on the other hand, could be used to provide feedback. This form of intervention usually entails an individual being given medical photographs of his or her body, along with some explanation, emphasising the consequences of the findings and how adjustments in behaviour can lower health risks [2].

Medical imaging provides clinicians with access to previously unavailable and unseen personal information, allowing them to analyse present physiological damage and disease progression, as well as define levels of future disease risk. Computed tomography (CT) is used to detect artery calcification, ultrasound is used to assess liver damage, and radiography is used to examine osteoporosis-related changes in bone density. Medical imaging has also been used in nonclinical situations, such as for health promotion among ostensibly healthy populations, with ultraviolet (UV) photography being used to assess sun-related skin damage as an example. Imaging data frequently necessitate some level of professional interpretation, and as a result, recipients require explanation in order to comprehend them. Feedback is frequently confined to spoken and/or written descriptions or classifications, with varying degrees of exposure to scan images and explanation of results. Individual communication of source images is not routinely or consistently included in standard clinical practice—for example, it is not specified in guidelines for carotid imaging procedures—but it is sometimes done depending on context and case, and patients may desire it. As medical imaging technologies become more accessible and widely used their potential to induce changes in health behaviours and outcomes grow. In the year 2018–2019, 44.9 million imaging tests were recorded in England, an increase of 9% over the previous year [3].

Visual pictures are commonly regarded as a particularly powerful form of communication, as evidenced by two popular idioms: "Seeing believes" and "A picture is worth a thousand words." In keeping with societal discourse, medical imaging technologists and physicians tend to retain the belief that medical imaging scans reveal an objective truth and are interchangeable with the actual body being photographed. The concept of seeing is frequently confounded with that of understanding in modern society's increasing saturation with visual images. Processing of concrete stimuli such as visuals can engage automatic and emotionally evocative associations in memory, according to psychological theory, and assist establish coherent links between the information presented and the consequences for health and future risk reduction. As a result, visual imagery may be immediately understandable and effective, as evidenced by a large and diversified body of public health and behavioural science studies emphasising the potency of aversive visual images for cognition and behaviour [4].

The goal of this study was to see how much feeding back medical imaging results that enable individuals to visualise their own health risks, derived from a variety of imaging technologies and health conditions, can change recipients' behaviours and risk factors in both clinical and nonclinical settings. Prior evidence syntheses, which have often had a narrower focus, have not addressed this comprehensively, to our knowledge. These, for example, have looked at the impact of coronary artery calcium screening but not precisely the role of visualised feedback, and have mostly or entirely relied on observational data with minimal randomised evidence. Systematic studies of treatments to enhance sun protection behaviours have also been undertaken, but they have often evaluated a broad range of interventions rather than those focused on medical imaging.

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Most importantly, due to the insufficient evidence available at the time, a Cochrane review of visual feedback of medical pictures published in 2010 was unable to minimise confusion on the topic, but this has substantially increased since then. This updated version of the Cochrane study intends to educate discussions on whether broad medical imaging use offers a largely untapped opportunity for improving health-related behaviours and lowering risk factors [5].

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