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Use of Artificial Intelligence (AI) to find Implication of Ramdhan Fasting for Human Health Care

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ABSTRACT: Artificial intelligence (AI) in the healthcare sector is receiving attention from researchers and health professionals. Few previous studies have investigated this topic from a multi-disciplinary perspective, including accounting, business and management, decision sciences and health professions.

Ramadan is the ninth month of the Islamic lunar calendar and is observed by Muslims as a month of fasting. All Muslim adults are expected to fast; nevertheless certain subgroups, including sick, frail subjects, and pregnant women, among others, are exempted. Ramadan fasting has been shown to impact on body systems in different manners. The influence of Ramadan fasting on immune system regulation remains elusive; however, immune system changes, such as the modulation of body response to various infectious, stressful, and other harmful events, are of great interest during fasting.

Several studies highlight the effects of artificial intelligence (AI) systems on healthcare delivery. AI based tools may improve prognosis, diagnostics, and care planning. It is believed that AI will be an integral part of healthcare services in the near future and will be incorporated into several aspects of clinical care. Thus, many technology companies and governmental projects have invested in producing AI-based clinical tools and medical applications.

We develop a model mainly based on value perceptions due to the specificity of the healthcare field. This study aims at examining the perceived benefits and risks of AI medical devices with clinical decision support (CDS) features from consumers' perspectives. We use an online survey to collect data.

I. INTRODUCTION

AI technology, including algorithmic machine learning and autonomous decision-making, creates new opportunities for continued innovation in different industries ranging from finance, healthcare, manufacturing, retail, supply chain, logistics, and utilities [1]. AI can be used in the form of clinical decision support (CDS) to support patient specific diagnosis and treatment decisions and perform population-based risk prediction analytics [2]. Promoting AI-based services has become one of the focal points of many companies' strategies [3]. The important changes made by AI have inspired recent studies to examine the impacts and consequences of the technology and to investigate the performance implications of AI. Though, this objective needs an in-depth understanding of the factors affecting the acceptance of AI-based services by potential users in different manufacturing and service fields. Previous studies highlight the importance of AI in healthcare, especially in medical informatics [4]. AI is able to provide improved patient care, diagnosis, and interpretation of medical data [5]. A study shows that AI technology used for breast cancer screening reduces human detection errors, but some of the interrelated ethical and societal trust factors, as well as reliance on AI, are yet to be developed [6]. The use of AI-driven recommendations in health care may be different from other sectors, mainly because of highly sensitive health information and high levels of consumers' vulnerability to possible medical errors.

The lifestyle of some Muslims will not change greatly during Ramadan, but for others this is an opportunity for

contemplation and spiritual activities while others still will spend much of the night engaging in social activities with friends and family. For this last group, an increase in food intake and a change in the composition of the diet are to be expected. While short term effects on body composition and body mass might be expected because of changes in energy intake and physical activity levels, these changes seem unlikely to have long term effects on body mass. Glycaemic control and cardiovascular risk factors will also be strongly influenced by changes in energy balance and body composition, so differences in response might be expected in different populations. Non-nutritional factors may also have a significant impact on the findings. In some groups that have been studied, Ramadan is a time of increased participation in stress-reducing and spiritual activities and a reduction in caffeine and nicotine use. These changes potentially have both short-term and long term effects on cardiovascular health.

II. A BRIEF ABOUT THE PRESENT RESEARCH STATUS IN DOMAIN UNDER CONSIDERATION (Literature Review)

The effects of Ramadan fasting on blood lipids has been extensively studied over many years, but the pattern of response and the implications for cardiovascular risk are not entirely clear. In some published studies, there is evidence of an increase in some antiatherogenic biochemical parameters, including high density lipoprotein cholesterol (HDL-cholesterol) and apolipoprotein (apo) AI, and a decrease in some atherogenic parameters, including triglycerides total cholesterol (TC), apoprotein B, and lowdensity lipoprotein cholesterol (LDL-cholesterol) [8, 9, 10, 11, 12, 13]. In some other studies, however, some of these parameters have remained unchanged or even moved in the opposite direction [14, 15, 16, 17]. A few studies have included both fasting participants and non-fasting controls. [18] saw reductions in triglycerides, total cholesterol and LDL-cholesterol in fasting participants with no changes in the control group. Some of the apparent contradictions may be related to the timing of blood sampling in relation to the last meal and to changes in the energy intake and diet composition during the fasting period. Where changes have been observed, these are generally reversed within a few weeks after the end of the Ramadan fast, though some studies have shown that changes may last for at least 3 weeks [19] and even 4 weeks after returning to the habitual diet and lifestyle [20].

An increasing number of healthcare service companies are investing in the development of AI embedded in mobile health devices or health apps to improve patient safety, increase practice quality, enhance patient care management, and decrease healthcare costs. However, previous studies suggest that not all individuals are willing to accept the use of medical AI devices [7]. Successful implementation of AI-based systems requires a careful examination of users' attitudes and perceptions about AI [5]. Thus, investing in AI technology without recognizing potential users' beliefs and willingness to accept AI devices may lead to a waste of resources and/ or even a loss of customers. This is especially true in the healthcare sector, where patient engagement is considered as one of the most critical determinants of healthcare quality. If individuals do not view interacting with a medical AI device as useful, they may demand interactions with physicians, and in turn, the AI-based devices may remain unused.

III. THE OBJECTIVES ARE TO STUDY

We first briefly review four relevant aspects from medical investigators' perspectives:

1. motivations of applying AI in healthcare
2. data types that have be analyzed by AI systems
3. mechanisms that enable AI systems to generate clinical meaningful results
4. disease types that the AI communities are currently tackling

IV. TENTATIVE RESEARCH METHODOLOGY

Before AI systems can be deployed in healthcare applications, they need to be 'trained' through data that are generated from clinical activities, such as screening, diagnosis, treatment assignment and so on, so that they can learn similar groups of subjects, associations between subject features and outcomes of interest. These clinical data often exist in but not limited to the form of demographics, medical notes, electronic recordings from medical devices, physical examinations and clinical laboratory and images.

Sample size (male (M), female (F), total), mean and standard deviation (or range) of the age and body mass index (BMI) of participants before Ramadan, year study was conducted (which may have been different from the year the study was published), the location where the study was conducted, fasting duration rounded to the nearest half an hour (note that if fasting duration was not stated in the publication, but the year and location in which the study was conducted were given, fasting duration was estimated based on the average time between sunrise and sunset during

Ramadan in the relevant year and location), timing of the pre-Ramadan measurement ('pre-R'), timing of the post-Ramadan measurement ('post-R'), timing of the follow-up measurement ('follow-up') relative to the Ramadan fast, mean and standard deviation of weight, method of body composition measurement, mean and standard deviation of fat percentage (%), absolute fat mass (kg), and fat-free mass (kg), method of physical activity measurement, mean and standard deviation of 'maximum effort physical activity.

V. CONCLUSION

Disruptive advances in technology inevitably change societies, communications, and working life. One of the fundamental changes that could impose significant effects on healthcare is the widespread implementation of AI technology. AI technology is an integral element of many organizations' business models, and it is a critical strategic component in the plans for many sectors of business, such as healthcare institutions. Implementing advanced information systems (such as AI) in healthcare requires an in-depth understanding of the factors associated with technology acceptance among groups of stakeholders.

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