Readability of Patient Information Leaflets Improved by Large Language Model Artificial Intelligence

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Introduction: Artificial intelligence (AI) is revolutionizing healthcare. Emergency departments (EDs) are under increasing time pressure, and physicians often rely on patient information leaflets (PILs) to inform/reassure patients with common presentations. International recommendations require PILs to be at an appropriate reading level (that of a 12-year old child), thereby improving comprehension for patients (7, 8). Some PILs are too difficult to read for patients(9, 10), demanding consideration of appropriate lexical complicity (7, 11).
Methods: This study assesses whether commercially available large language models (LLMs) can improve the reading comprehension level of PILs. The readability/lexical complexity of 19 PILs currently used in an Irish ED was measured with validated reading level metrics, including the Common European Framework of References for Languages (CEFR) grade, using an online tool against the set standard reading comprehension. Two LLMs were employed with the same instructions to rewrite the PILs, scored using the same metrics, and improvements quantified.
Results: Only three current PILs met the required lexical complexity level (median 63.3%, IQR 7.3). LLM generated PIL overshot the improvement in reading level, simplifying it by a median of 4% (1 CEFR level). The first LLM improved the median reading level to 60.25% (CEFR = C1, IQR 6.41), while the second LLM resulted in a median reading level of 56.92% (CEFR = C1, IQR = 5.6), meeting the target in 12 of 19 PILs.
Conclusion: The findings demonstrate the importance of a critical review of the reading levels used in EDs. LLMs may be employed to facilitate improving readability, but may not be able to reach the instructed reading level at first iteration, and are more useful in simplifying PILs at an initial college reading level. All AI-generated PIL retained the core message. Currently available LLMs may be utilized by healthcare workers to simplify PIL, improving readability to the recommended reading level.

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Proposal for a Digital Device to Improve the Impact of Disaster-Related Information, such as 'Nankai Trough Earthquake Temporary Information' on Mental Health

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Introduction: In Japan, temporary information is issued about disasters to reduce damage. On 8 August 2024, the Japan Meteorological Agency issued the first temporary information bulletin (Caution: Major Earthquake) about the possibility of a large-scale earthquake occurring in the assumed epicentral region of the Nankai Trough Earthquake. Although this kind of temporary information is useful for disaster prevention, we believe that it may have an impact on the mental health of many people, so we will conduct a survey and propose ways to intervene.
Methods: A psychological survey was conducted on web monitors before and after the 8 August 2024 Nankai Trough Earthquake Special Information (17 April; 22 August). A psychological survey was conducted on web monitors before and after the 8 August 2024 Nankai Trough Earthquake Special Information (T1: 17 April; T2: 22 August). The number of people surveyed was 300 for T1 and 1,400 for T2. The psychological test forms used were the Depression Anxiety Stress Scales (DASS)-21 and the Impact of Event Scale-Revised (IES-R). The scores are shown as the median (25th percentile - 75th percentile).
Results: The Depression score on the DASS-21 changed from T1 0 (0-1) to T2 2 (0-8), the Anxiety score from T1 2 (0-12) to T2 2 (0-10), and the Stress score from T1 2 (0-16) to T2 2 (0-6). The PTSD score, as indicated by the IES-R, also changed from T1 3 (0-9) to T2 4 (0-17). Mann-Whitney's U test showed a significant difference in Depression, Stress, and PTSD scores ($P < 0.05$).
Conclusion: Although this is temporary information for disaster prevention, it may affect the mental health of many people. To maintain the mental health of these many people, our team would like to propose the introduction of smartphone apps such as the me-fullness® app.

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The Acute Radiation Syndrome-Mitigator Romiplostim and Secreted Extracellular Vesicles Improved Survival in Mice Exposed to Myelosuppressive Doses of Ionizing Radiation

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Introduction: There is a growing concern about the risk of exposure to acute and lethal doses of ionizing radiation due to terrorist attacks and the recent threat of nuclear weapons. In the event of a radiological or nuclear public health emergency, several thousand people suffer severe injuries from radiation exposure, which can lead to acute radiation syndrome (ARS). Thus, there is a grave need for therapeutic strategies to ameliorate ARS and save the lives of survivors. It was reported that the thrombopoietin receptor agonist romiplostim (RP) has the potential to rescue mice exposed to lethal total-body ionizing radiation (TBI). However, the detailed action mechanism of the radio-mitigative and life-saving effects of RP remains unclear. This study focused on the extracellular

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