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Ethical Challenges of Artificial Intelligence for Smile Design

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Objectives Purpose. Dental softwares are increasingly usin Artificial intelligence (AI) for smile design. However, using AI raises numerous technical and ethical concerns that are currently not discussed. This study aims to identify and evaluate these ethical issues.

Methods Methods. An international consortium of dental experts specialized in AI was engaged to formulate ethical challenges raised by the use AI for smile design. An e-Delphi protocol was secondly used to obtain an agreement of the ITU-WHO group on key ethical principles related to the use of AI (Wellness, Respect for autonomy, Privacy protection, Solidarity, Governance, Equity, Diversity, Expertise/prudence, Accountability/responsibility, Sustainability, and Transparency). Each principle included examples of ethical challenges that patients and practioners could encounter when using AI for smile design.

Results Results. On the first round of the e-DELPHI, 28 participants agreed that seven items should be considered in smile design (diversity, transparency, wellness, privacy protection, prudence, law and governance, and sustainable development), but the remaining four items (equity, accountability and responsibility, solidarity, and respect of autonomy) were rejected and had to be reformulated and resubmitted. After this second round, participants agreed to all items.

Conclusions Conclusions. This work first emulated and proposed possible AI Ethics challenges when practitioners and patients use AI for smile design. Following a Delphi protocol, 11 items were emulated, and agreement was obtained. This work paves the way to further development of AI softwares and still open the discussion of how we can act for more trustworthy AI in dentistry.